FIRE ENGINEERING

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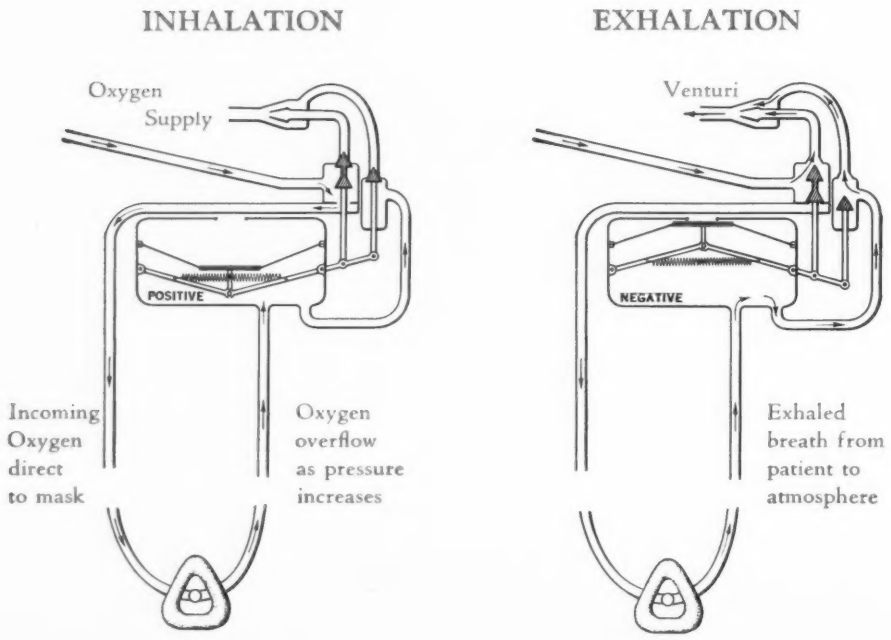
The Journal of the Fire Protection Profession Since 1877

OCTOBER, 1956

FIRE CHIEFS' CONFERENCE AND BUYERS' GUIDE ISSUE

EMERSON Resuscitators



The flow of oxygen to the patient (left) in a standard portable model Emerson Resuscitator and the flow of exhaled breath (right) are shown diagrammatically above. Note the pattern of flow as controlled by the 3 valves. Oxygen coming to the patient never passes through any part of the mechanism that has carried exhaled breath. (There is back-and-forth breathing through the mask and mask-head, but these and the hoses are easily washable.)

If you happen to treat a patient who exhales disease germs, you can be sure that they will not be picked up in the mechanism by the in-flowing oxygen and carried to the next patient. Oxygen for the patient does not pass through the mechanism or the venturi.

This unique feature of Emerson Resuscitators is covered by U. S. Patent No. 2268172 and Canadian Patent No. 405705. Perhaps such cleanness is only occasionally of life-saving importance; but it is one reason why Emersons are known far and wide as the

"Simplest and Safest!"

SIMPLE TO OPERATE — ECONOMICAL OF OXYGEN — VEPSATILE — RUGGED

Made by the makers of Emerson Iron Lungs and other medical breathing equipment

J. H. EMERSON COMPANY
32 COTTAGE PARK AVENUE, CAMBRIDGE 40, MASSACHUSETTS, U. S. A.

Experience

EXPERIENCE writing specifications for a new fire truck, teaches you what features are most important and worthy of inclusion; what capacity and durability are required and what type of fire fighting tools are most vital and dependable.

EXPERIENCE tells you what will serve best in combating a fire and what kind of equipment will get it there most swiftly and surely.

EXPERIENCE teaches you that a dependable siren and warning light are of utmost importance and

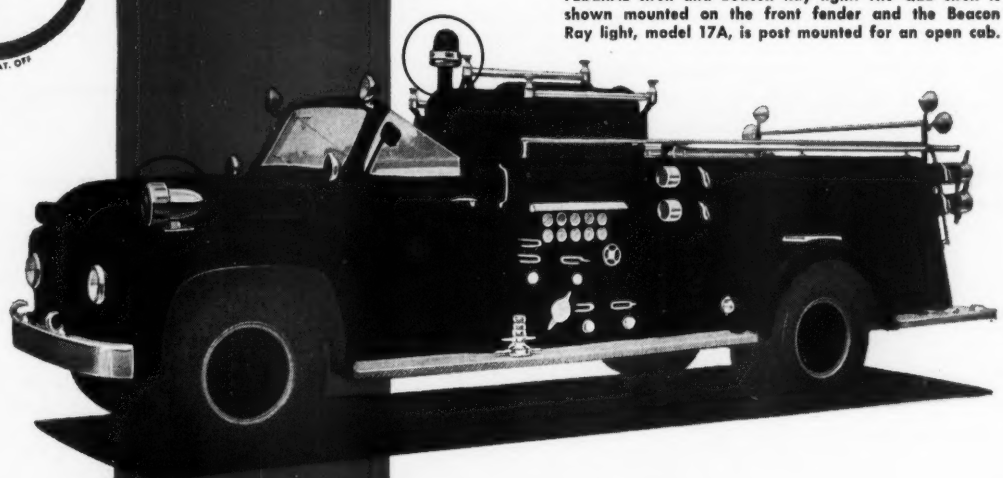
EXPERIENCE also teaches that to be assured of having these on your own vehicle you must definitely SPECIFY FEDERAL coaster sirens and FEDERAL Beacon Ray lights!

EXPERIENCE, yours, and that of other fire fighters, should be enough to convince you! **This** is only to remind you to include these two vital items **by name and model number** in your specifications.
Our literature, which will help you in your selection, will be mailed on request — write to us today for your copy.

EXPERIENCE, FEDERAL'S more than 50 years of designing and perfecting sirens and lights to meet your needs, is absolute assurance of maximum satisfaction!

REG. U.S. PAT. OFF.

This outstanding Class A pumper was built and delivered by the MIDWEST Fire and Safety Equipment Co., Inc. of Indianapolis, Ind. It is a 750 gallon per minute pumper mounted on a Ford F-800 chassis. Protection for this vital piece of equipment is achieved with a FEDERAL siren and Beacon Ray light. The Q2B siren is shown mounted on the front fender and the Beacon Ray light, model 17A, is post mounted for an open cab.



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FIRE ENGINEERING

VOL. 109 OCTOBER, 1956 NO. 10

IN THIS ISSUE

FEATURES

Progress—How Far and How Fast—*An Editorial* 895
By Roi B. Woolley

Fire Service Progress—Prospect and Retrospect 896
By Fred Shepperd

Home Fire Inspections . . . Past, Present and Future 900

Miami Fire Department Has Long Record of Accomplishments .. 906
By Newton L. Wheeler, Sr.

Chemistry of Catalysts in Relation to Fire Protection 908
By Paul F. De Gaeta and Arnold A. Weintraub

Electronic Traffic Control to Speed and Safeguard Fire Force Response 913

What Progress in Fire Service Communications? 916

The Centrifugal Fire Pump Goes Up-Stage 920
By Donald M. O'Brien

The Rise and Decline of the Water Tower 924
By Clarence E. Meek

The Apparel Proclaims the Man 928

Fire Hose Takes on New Stature and Stamina 930

Fire Fighter Personnel Protection 933

New York Closes High Pressure Stations in Favor of Modern Fire Department Pumpers 936

Simultaneous Multiple Alarm Fires Endanger Portland, Oregon, Areas 938

The Genesis of a County Fire Department 940

Problems of Speedway Fire Protection 942

Large Fire Force Lacking Master Streams Fights Costly Fire 946
By John D. Klinepeter

Fire Service Maintains Steady Building Pace 948

Getting Rid of Water by Means of Drains, Dikes and Chutes
Part XVII of a series 950
By Roi B. Woolley

I. A. F. C. Conference Personalities and Program 956

DEPARTMENTS

News of the Manufacturers 972

False Alarms 974

Among the Buffs 996
By Paul C. Ditzel

The Round Table 998

Questions and Answers 1004

What's Burning? 1009

Persons in the News 1012

The Watch Desk 1014

Obituaries 1026

World-Wide Fire News 1027

Convention Dates 1029

Where to Buy—1956 Equipment Directory 963

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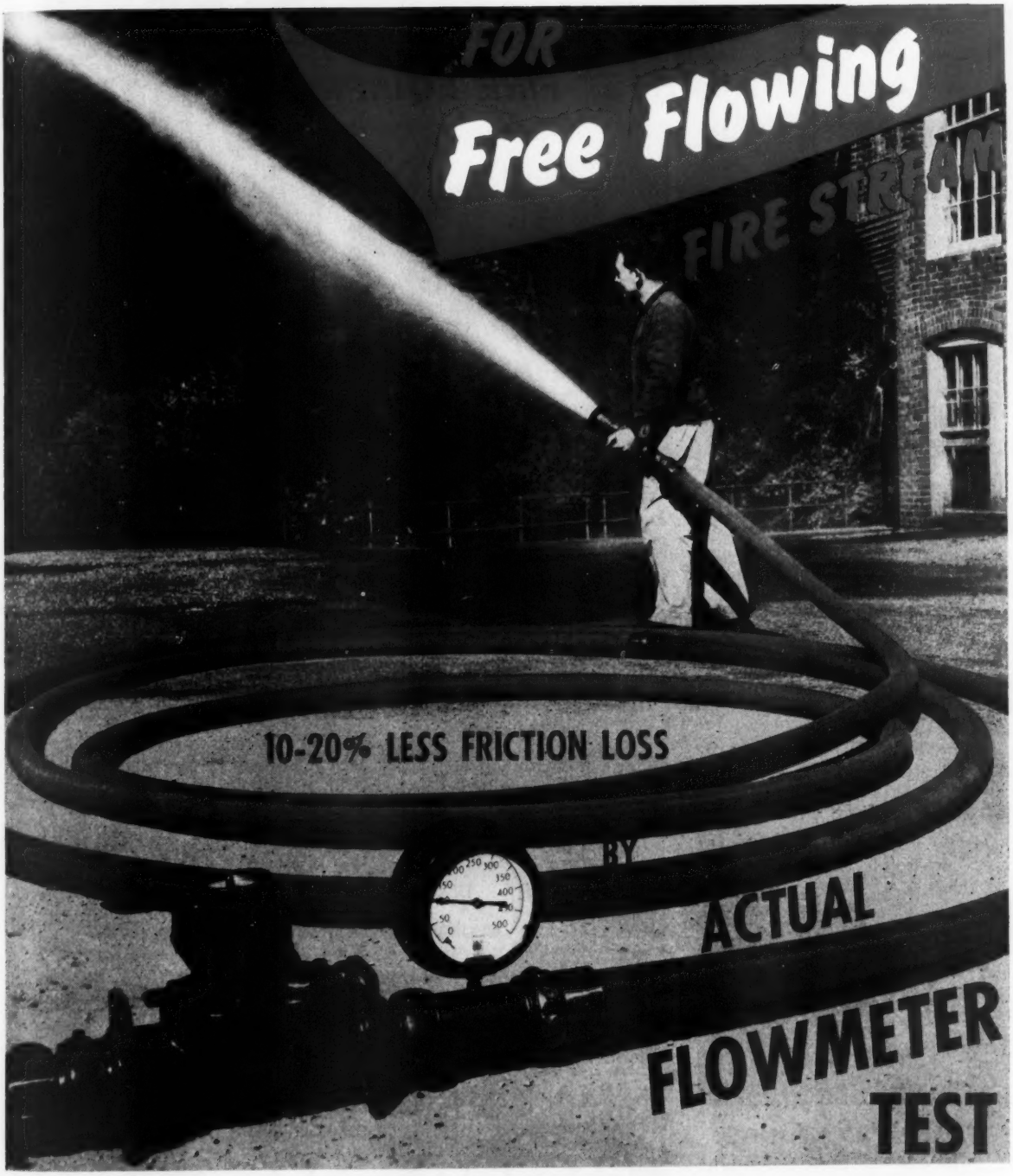

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THE ONLY EXCLUSIVE MANUFACTURER OF FIRE HOSE IN AMERICA

SANDY HOOK CONNECTICUT

Specify AKRON

"AMERICA'S BEST FIRE EQUIPMENT"

TWO INLET MULTIVERSAL

Light weight — 55 lbs. Handwheel adjustment. Perfectly balanced. Relieves manpower for other duties. Low friction loss. Akron stream shapers for non-feathering stream. Can be used with FOG-HOG for complete versatility. Style #491.

"FOG-HOG" NOZZLE

DELUGE

With all-round indicator for preselection of stream. Tremendous gallonage and projection. Use on ladder pipes, deluge guns, deck pipes. All degrees of fog, straight stream or shut-off instantly available. Bind-free operation at all pressures. ROCKER LUG—available in 500, 1000, 2500.

"P.D.Q." NOZZLE

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Adjustable through all angles of solid fog and straight stream. Akron quality ball shut-off. Guaranteed gallonage. Positive stream positioning indicators. Swiveling "ROCKER LUG" base — handle is always up. Corrugated no-slip grip. 1", 1½" and 2½" sizes.

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Drop-forged for strength. Light weight — perfect companion for light weight hose. "ROCKER LUG" — Higbee Indicators. Tapered hose bowl — stays on hose under all pressures. Unconditionally guaranteed to give complete satisfaction. Style #88

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Two and one-half inch FULL FLOW Ball-Valve Siamese. One 2½" female inlet . . . two 1½" male outlets. Solid red brass casting. Operating pressures to 500 lbs. The industry's best made and most widely used Siamese. Style #481.

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Instantaneous connection to all thread sizes. Your own thread on male end. Moveable bronze jaws provide adjustable female. Push handles together and watertight connection is made. Light weight — 7 lbs. No wrenches needed. Style #575.

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Wrenches ready for immediate use. Complete with two No. 10 spanner wrenches. Wrenches always in place, one hand operation. Style #448.

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FIRE FIGHTING EQUIPMENT

AKRON BRASS MANUFACTURING CO., INC.
WOOSTER, OHIO

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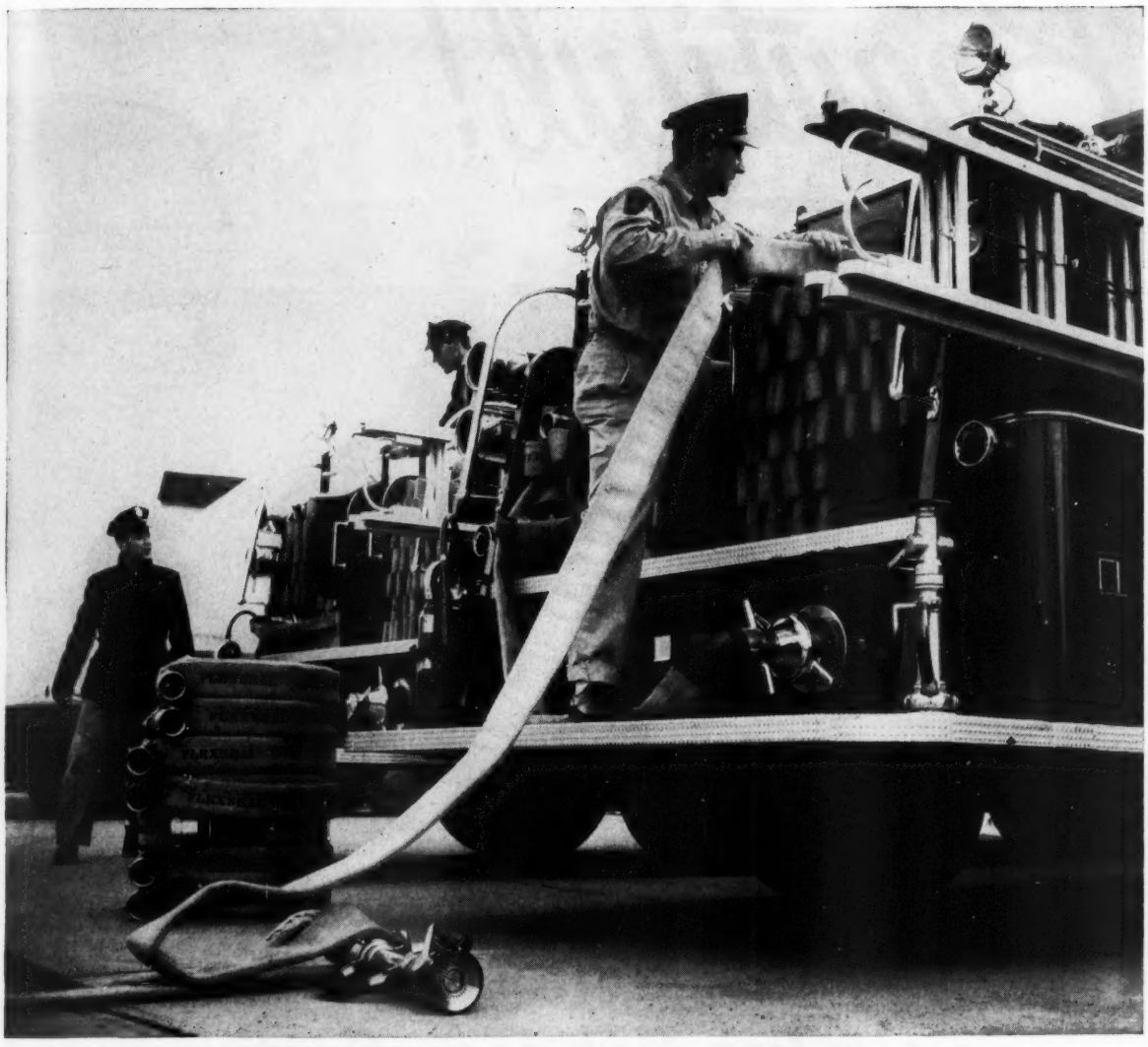
B.F.Goodrich



Now B. F. Goodrich hose has 10 times more mildew resistance

HERE's the new fire hose that's 10 times more resistant to mildew attack and rotting. It's B. F. Goodrich Flexseal, protected with the exclusive Superseal treatment.

Unlike ordinary treatments that just coat the surface of hose, the Superseal solution penetrates every cord in both the inner and outer jacket. This special chemical treatment also protects against moisture absorption and freezing, increases the hose's resistance to fire.

However, this added protection is just one reason why the Maple Heights, Ohio, Fire Department equipped their two new pumpers with B. F. Goodrich hose. With Flexseal, they get a hose that's 23% lighter, 50% stronger, much more flexible than ordinary hose. Trucks can carry a third more hose, and it cuts minutes from loading time because it racks naturally on the truck bed, doesn't kink or twist.

And most important—with all these improvements, B. F. Goodrich Flexseal costs no more than ordinary treated hose. There's a B. F. Goodrich fire hose distributor near you, ready to bring this and other B. F. Goodrich hose improvements to your department. Give him a call or write *B. F. Goodrich Industrial Products Company, Dept. M-769, Akron, 18, Ohio.*

B.F.Goodrich

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Beautiful!

...and packed with practical, original *American* features that increase your fire-fighting effectiveness!

At the Convention—see all the practical, top-quality features of American Fire Apparatus!

At American, you can select from a wide range of standard or custom-built models tailored to suit the needs of your community. Select the make of chassis you prefer and the body design you like best. Choose the Barton-American Pump you wish from a wide range of Midship models—two-stage, four-stage or the *new* single-stage types—or Front-Mounted Pumps with the *only* positive, inter-locking clutch that can't slip and leave you helpless at a fire.

If you're looking for superior performance, look at American's superior features!

Contact your nearest American Representative soon!

American

AMERICAN FIRE APPARATUS CO.

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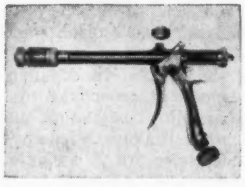
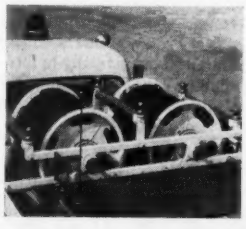
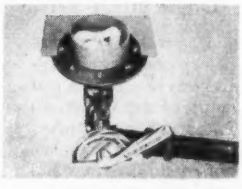


BARTON SUPER-FOG GUN —Famous for both long-range and close-up fog. Effective with normal and/or high-pressure, small or large volume straight streams or fog. Now with new refinements!

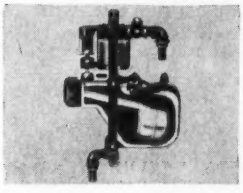
NEW ENGINE GOVERNOR —An entirely new, superior Barton-American engineered design. It combines pressure regulation and engine speed control . . . instantly idles engine whenever pump for *any reason* loses its pressure.



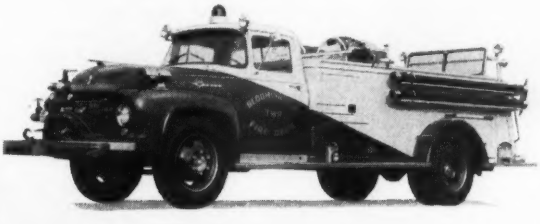
IMPROVED ELECTRIC REWINDS — Pioneered by American . . . now with new features. Single starting motor. Convenient, quickly adjusted brake control. Superior reel design permits hose expansion under pressure, protects hose at couplings. No elbows —reduces friction.



FROST-PROOF TANK OUTLET —Valve location in wide sump basin prevents possibility of freezing. Strainer baffles prevent swirl—insure fast, steady water flow. Entire valve unit easily removable for repair or tank clean-out.



FAST VACUUM PRIMER — Motor vacuum priming — now improved for 100% faster operation. Trouble-free —no lubrication or adjustments needed for life of unit. Furnished as part of dual priming when required.



CHOOSE BARTON MODELS OR FRONT-MOUNTED PUMP MODELS

You benefit from the finest of plant and testing facilities.

Increase your fire-fighting efficiency and safety with

M.S.A. MASKFONE

Self-contained communication system between two mask wearers or a wearer and a remote control point. No batteries or external power needed. Clear, crisp voice communication aids fire-fighting efforts by permitting instant relay of instructions, warnings. Write for details.

M.S.A. "ALL-SERVICE" MASK®

For fire-fighting efforts in air contaminated with smoke and gas, but where sufficient oxygen is present to support life, the "All-Service" Mask assures dependable breathing protection to the wearer. Available with the M.S.A. "Cleartone" Speaking Diaphragm for clear speech transmittal. Write for details.

M.S.A. PNEOLATOR

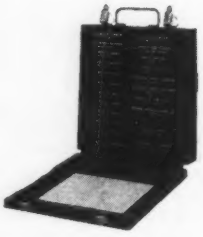
Assures maximum chances of recovery in all cases of arrested breathing. Provides oxygen at the preselected amount and pressure. There is no suction cycle—exhalation takes place by the normal passive return of respiratory muscles. Portable, rugged carrying case. Write for complete details.

M.S.A. STREAMLINED FIREMAN'S HELMET

Meets all requirements for fire-fighting hats—molded laminated plastic takes bumps and blows, withstands water, oil, heat, provides high dielectric strength. Streamlined design adds eye-appeal; shields are of tough, full-grained leather; winter lining zips in quickly. Write for details.

M.S.A. FOILLE BURN KIT

This kit is supplied with four aerosol sprays for quick, effective application to burned areas to ease pain and aid in the control of shock. Aerosol application is fast, effective, always ready. Kit also contains a complete assortment of first aid dressings and accessories. All units are assembled in a weather-proof steel case. Write for details.



M.S.A. FIRST AID KIT

Designed to meet all the requirements of fire department service. Contents of the M.S.A. Kit are individually wrapped in cellophane to protect against dirt, dust and moisture. All-weather steel case design provides an added safeguard. A complete supply of emergency treatment for immediate application is contained in unit packages for quick location, individual treatment. Write for details.

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A compact, portable, easy-to-use instrument for checking suspected areas for explosive gases and vapors during fires and in general survey work. Body carrying straps, and one hand operation permit unhampered use. Easily read dial, rugged, simple to maintain. Write for details.

M.S.A. FLOOD LAMP

Safe in gaseous atmospheres, this lamp combines brilliant, unfailing illumination with easy portability. Equipped with standard Edison Batteries in magnetically-locked steel container. Lamp housing is water and dustproof. Write for details.

Call the M.S.A. man
on your safety problem
... his job is to help you

SAFETY EQUIPMENT HEADQUARTERS

MSA

proved M·S·A equipment

M·S·A CHEMOX®

This unit provides complete breathing protection for firefighters in oxygen-deficient or unbreathable atmospheres. Pure oxygen, released from the replaceable chemical canister the instant the wearer breathes, continues automatically in accordance with the breathing demands. This protection is provided for a minimum of 45 minutes under rugged working conditions.

The Chemox is light—only 13½ pounds. It is comfortable, designed for freedom of movement. The canisters can be stored indefinitely—are always ready. M. S. A. "Cleartone" Speaking Diaphragm, which permits clear communication between mask wearers, is standard equipment. Write for details.

M·S·A AIR-MASK

... available with AIR or OXYGEN

This unit, designed to bring respiratory protection and comfort to users in unbreathable atmospheres, supplies air or oxygen in exact accordance with breathing needs. During exhalation, the flow ceases—an economy measure that greatly lengthens service life.

Here are a few of the construction details—

- ... large, well-defined figures on pressure gauge for easy reading.
- ... the high pressure hose is made of wire-inserted neoprene for increased wear.
- ... the redesigned cylinder valve connects directly to the cylinder and the improved working parts of the valve provide greater serviceability and less maintenance.
- ... the nylon harness is easily adjusted and provides maximum strength. It is highly chemical and water-resistant.
- ... the new color scheme is an attractive dark green and yellow. This striking appearance makes it easier to spot men in working areas. Write for details.

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201 North Braddock Avenue, Pittsburgh 8, Pa.
At Your Service: 76 Branch Offices in the United States

MINE SAFETY APPLIANCES CO. OF CANADA, LTD.
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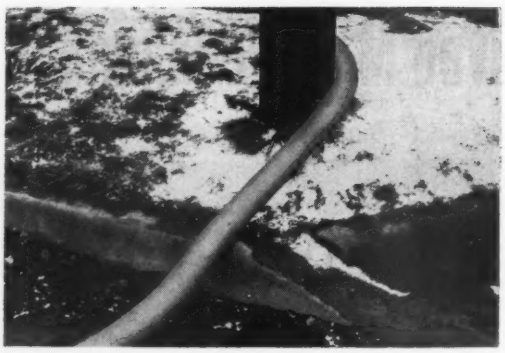
Cable Address: "MINSAF" Pittsburgh

FLEXIBLE– Sure, Republic Fire Hose is flexible or no self-respecting fire department would use it . . . and lots of them use Republic Fire Hose exclusively.



DURABLE– High burst and resistance to pressure shock or water hammer. Strength of filler yarns gives this quality . . . no hose on the market has any better yarn in the jacket than Republic Fire Hose.

GOOD GRIP–You can grip and hold onto a rough surface much better than a smooth one. The rough texture of Republic Fire Hose inspires many firemen to identify Republic's as the "good gripping hose."

STORAGE SPACE–Curing shapes the hose. Republic's Flat-Cure permits easy handling, storing and coiling of more footage than any other shape.

GOOD FIRE HOSE!

Republic Rubber makes *good fire hose*...cotton or cotton and dacron jackets, rubber lined.

Everything about Republic's Fire Hose is special . . . the rubber (specially compounded); the yarn (specially selected); the weave (special design), to give the qualities of flexibility, water-tightness and durability. Below are the four grades of Municipal Fire Hose made by Republic Rubber. Order from Youngstown, Ohio, or any Republic District Office.

MILDEW-PROOFED

Provar treatment of cotton jackets is an exclusive process developed by Republic Rubber for the prevention of mildew and rot. The treatment is durable, will not wash out or lose its effectiveness. All four grades of Municipal Fire Hose made by Republic are supplied with Provar protection.

CHAMPION–Dacron filler, test pressure of 600 lbs. Best grade Fire Hose made.

TOWER – Dacron filler, test pressure of 400 lbs.

CHARIOT – Cotton yarn, test pressure of 400 lbs.

TARGET–Cotton yarn, made to meet demand for heavy-duty hose at moderate cost.

REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS

Now... Talk through noise

NEW TRANSISTORIZED POWER VOICE speaker

The secret is in the exclusive **"GOLDEN HEART"** *transistor*

Hear your mobile radio HUNDREDS OF FEET AWAY

Now your vehicles, in fact any mobile radio equipped vehicle, can get far greater volume than ever before, with the new Motorola transistorized Power Voice Speaker.

This new compact, inexpensive speaker-amplifier combination delivers 10 TIMES MORE POWER than the conventional passive speaker. No more straining to hear messages. Just turn it up—it's got all the volume you'll *ever* need, all in this one small package. No longer is your driver shackled inside his vehicle...he can move about freely, hundreds of feet away, and still hear his dispatcher.

Secret of Motorola's newest development is the built-in transistorized amplifier, utilizing two long-life, Motorola power transistors. With the average 12 volt mobile radio system, the new speaker develops *15 watts* audio output. Even on a 6 volt system, you get 5 watts output—*much* more than the conventional one watt speaker level.

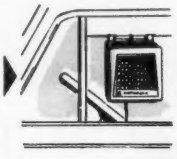
This power packed speaker is available for your mobile 2-way radio NOW. It can be quickly and easily added to most 6 or 12 volt installations. With the new Power Voice Speakers doing a bigger, better job for you, you'll also find low battery drain, bandpass response that accents voice frequencies, and versatile Quick-detach mounting...in a compact, all-metal housing.

You must *hear* the new Power Voice Speaker to appreciate what this added power can mean to you. Write, phone or wire today...or mail the coupon below.

New POWER VOICE speaker mounts firmly under dash in same familiar position

BUT...

detaches in a second to be hung from vehicle window and may be heard clearly hundreds of feet away.



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or a demonstration

Motorola Communications & Electronics, Inc., Dept. 4
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☐ I want to hear a demonstration of the Power Voice Speaker.

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COMPANY_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

Lightweight uniforms of DACRON and wool stay neater...resist abrasion at points of wear

REG. U. S. PAT. OFF.

All through a busy, strenuous day his lightweight uniform of "Dacron"* polyester fiber and wool keeps its neat appearance. "Dacron" helps uniforms resist wrinkles . . . hold their press—even in wet weather.

Made in comfortable tropical weights, these handsome uniforms have outstanding durability at traditional wear points: elbows, pockets, knees and cuffs. Less need for pressing and easy spot removal help reduce maintenance costs, too. It always pays to ask for "Dacron" and wool in summer uniforms! E. I. du Pont de Nemours & Co. (Inc.), Textile Fibers Department, Wilmington 98, Delaware.

DACRON
REG. U. S. PAT. OFF.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

**"Dacron" is Du Pont's registered trademark for its polyester fiber. Du Pont makes fibers, does not make the fabric or uniform shown here.*

WHY IS MACK THE FIRST NAME FOR fire apparatus?

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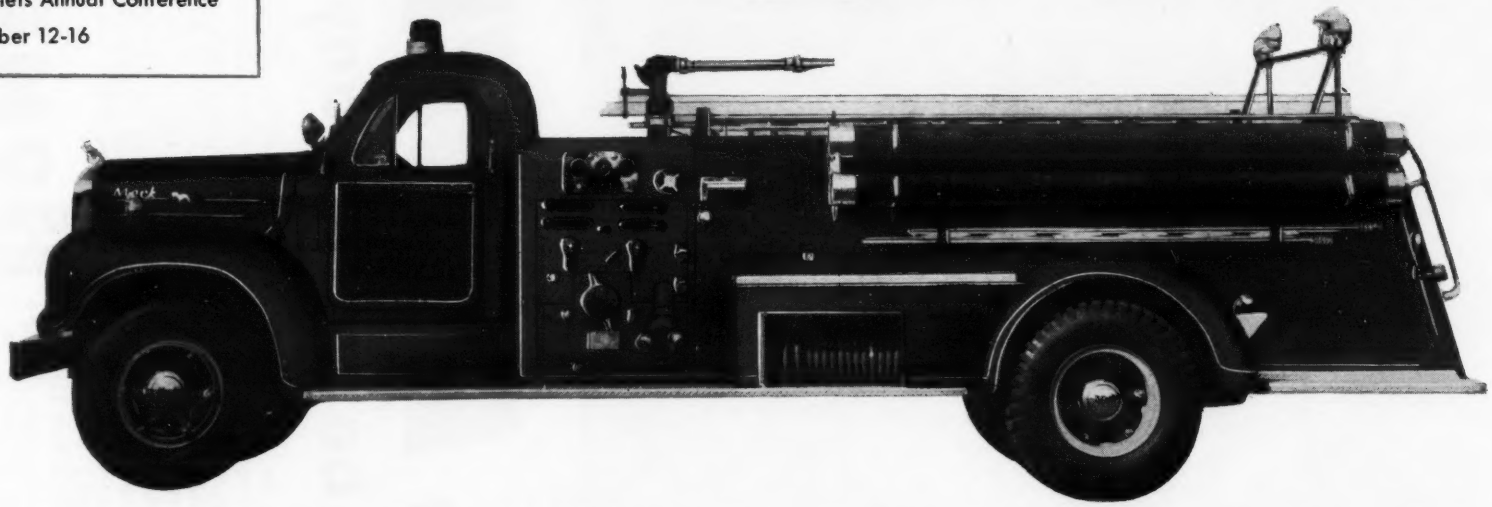
International Association of
Fire Chiefs Annual Conference
November 12-16

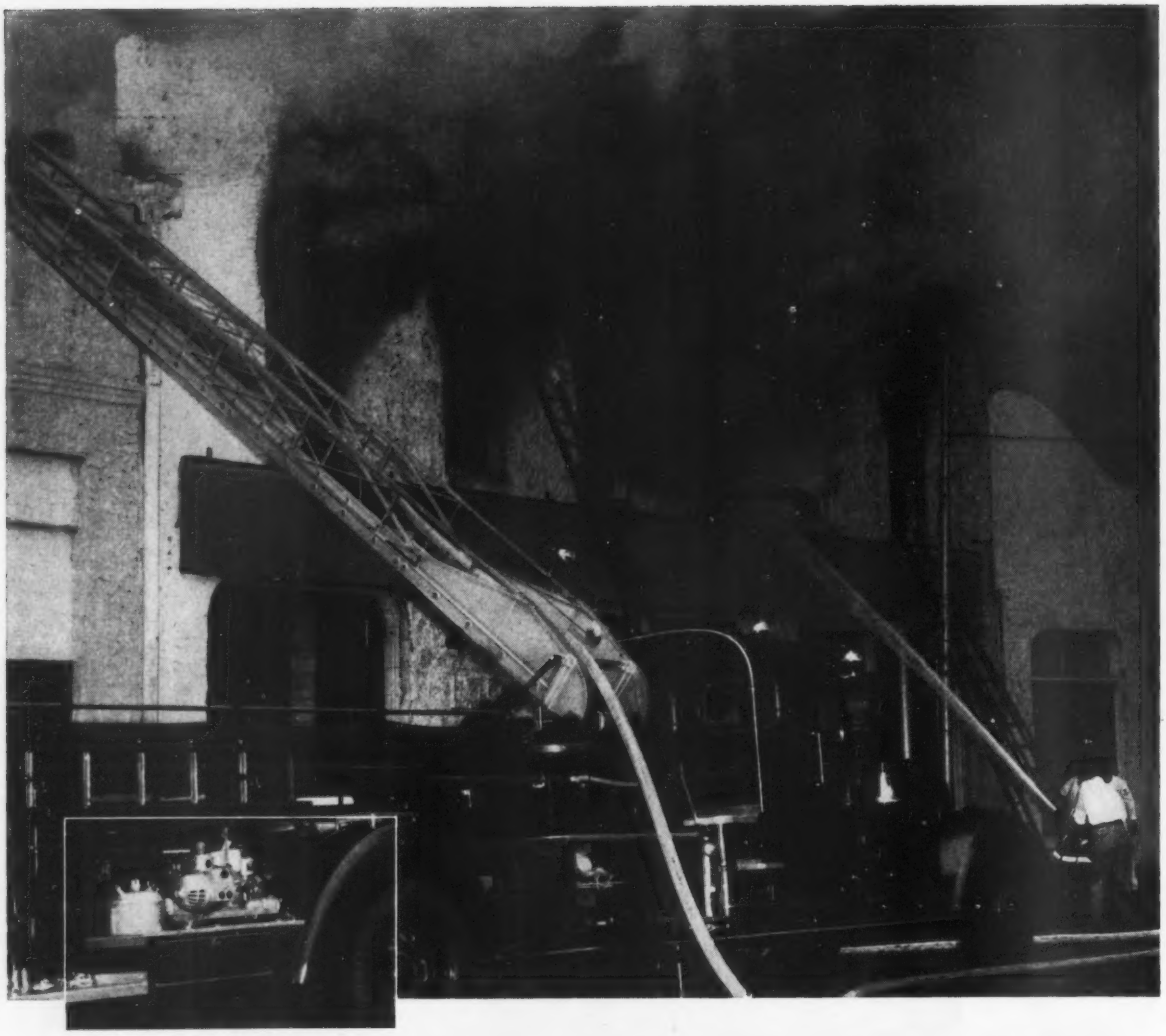


For the same reasons that Mack is known as the first name for heavy-duty trucks and buses! With its unique integration of engineering and production facilities, Mack makes more of its own components —engines, frames, axles, transmissions— than any other heavy-duty automotive manufacturer. What's more, Mack components are made of the finest materials . . . designed for incredibly long and dependable performance. Day after day, year after year, you'll find Macks doing the toughest, most demanding transport jobs all over the world—Mack engines often clocking 200 thousand repair-free miles . . . Mack frames, axles, and transmissions often withstanding a million punishing miles or more.

Is it any wonder, then, that Mack makes the finest, most dependable fire apparatus? Here's fire apparatus that's especially designed and built to meet the exacting standards of today's firefighter . . . with modern overhead valve engines that deliver top power at low r.p.m., special carburetors, low-pressure manifolds with sodium-cooled exhaust valves, double ignition systems, extra-capacity water pumps . . . engines that are sure starting and capable of pumping hour after hour without stalling or overheating . . . frames and chassis that are rugged and designed for maximum utility. These and other features make Mack fire apparatus the quality standard of the industry. For when it comes to fire apparatus where lives and property are at stake, Mack refuses to compromise on quality. Mack Fire Apparatus, Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

4311

COMPLETE LINE OF PUMPERS—500 TO 1250 GPM • • • SQUAD AND HOSE WAGONS • • • 65′, 75′, 85′ AERIALS • • • COMBINATION LADDER TRUCKS



Jacksonville, Florida Fire Department truck and Homelite 23A115 Generator — on the job — at a recent fire in Jacksonville.

Instant POWER that can be carried anywhere!

Fire Departments throughout the country use Homelite Generators . . . and it's easy to see why. Lightweight Homelite Generators feature constant voltage control, generous overload capacity, proven dependability . . . and they're easy to carry anywhere to provide power whenever it is needed — quickly, effectively, economically.

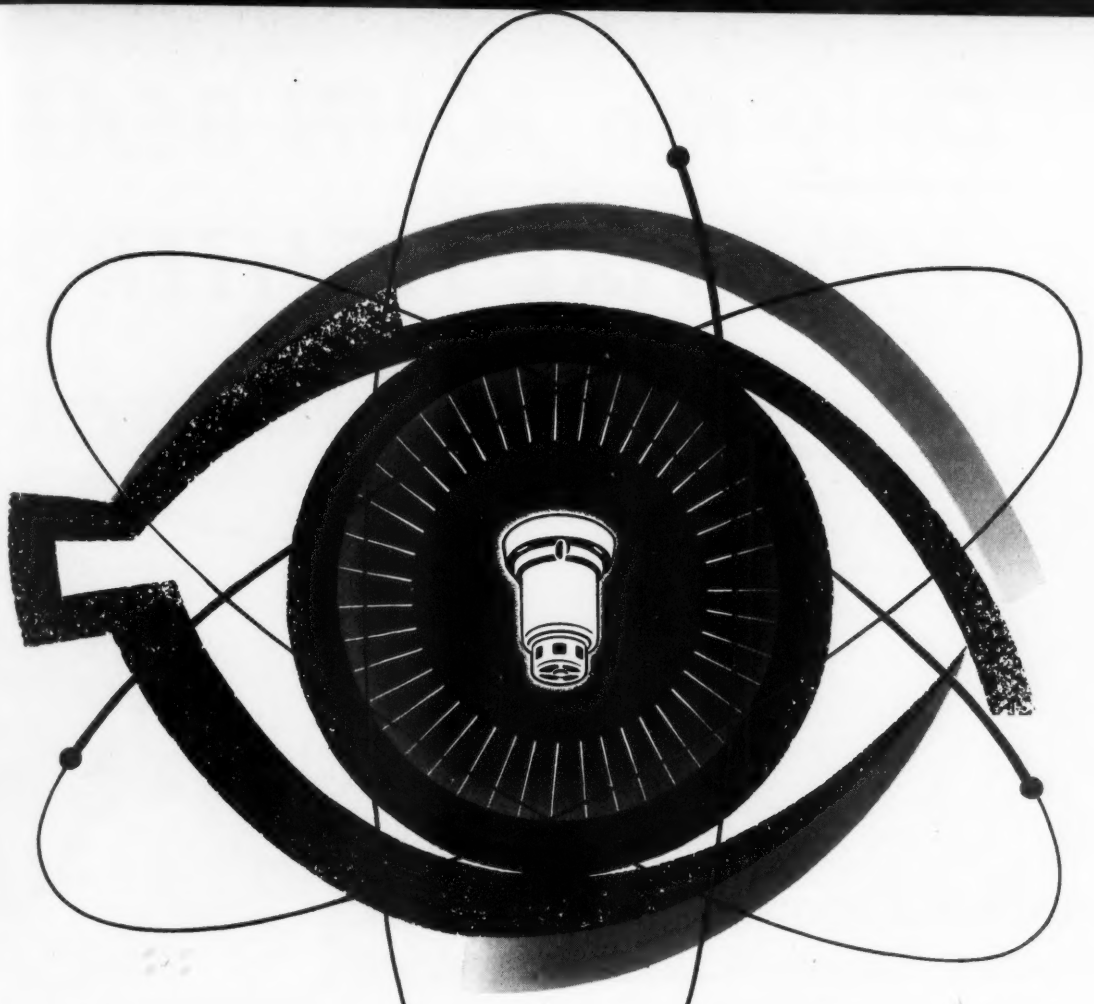
For example, the photograph above shows a Homelite Model 23A115 Generator — ready for action — on a Jacksonville, Florida Fire Department truck. This 1500 watt, gasoline-engine-driven unit provides 115 volt, 60 cycle, alternating current. It starts fast in any weather . . . supplying electric current identical to normal house current — perfect for emergency stand-by use, operating electric tools and floodlighting fire scenes at night.

If you are not already using a lightweight, dependable, Homelite Generator — get in touch with the nearest Homelite representative. There's a Homelite Carryable Generator for every power requirement . . . in all standard voltages . . . capacities up to 5000 watts.

Manufacturers of CARRYABLE PUMPS, GENERATORS, BLOWERS AND CHAIN SAWS

HOMELITE

A DIVISION OF TEXTRON INC.
310 RIVERDALE AVENUE
PORT CHESTER, NEW YORK



Nuclear energy takes over the fire watch...

And thus a revolutionary fire detection system—a product of modern science in the Atom Age—has changed the odds to favor the men who fight fires! Nuclear-powered PYR-A-LARM gives the Fire Department time to take effective action because it reacts to the products of combustion! In those vital minutes before dangerous temperatures build up—before smoke or flame develop—long before a thermal detection device would be actuated—PYR-A-LARM flashes a warning that can spell the difference between a fire of major proportions, and one brought quickly under control.

Let us show you how easily and economically nuclear energy can take over the fire watch for you, as it has for more than one hundred of the largest firms in the country. For a demonstration in your office, or for full information on the PYR-A-LARM System, simply mail the coupon below.

Among organizations that have installed the PYR-A-LARM System are:

Bethlehem Steel Co.
Chicago, Milwaukee, St. Paul & Pacific Railroad Co.
Consolidated Edison
Delaware Power & Light Co.
Illinois Bell Telephone Co.
United Airlines
U.S. Bureau of Standards
U.S. Navy (Guided Missile Ships)

See PYR-A-LARM demonstrated by Miami Fire Equipment Inc., Booth 87 at the Convention, Dinner Key Auditorium, Miami, Fla.

PYR-A-LARM

NUCLEAR FIRE PRE-DETECTION SYSTEM

Pyrotronics
DIVISION OF BAKER INDUSTRIES, INC.

Post Office Box 390, Newark 1, N. J.

NUCLEAR FIRE DETECTION AND ALARM SYSTEMS

Approved by Underwriters' Laboratories, Inc. and Factory Mutual Laboratories.

PYROTRONICS, Post Office Box 390, Newark, N. J.

☐ Kindly send literature describing PYR-A-LARM.
☐ Please contact me to arrange a demonstration in my office.

NAME.....

NAME OF PLANT.....

ADDRESS.....

CITY.....STATE.....

Only the JOHN BEAN HPV* FIRE-FIGHTER has all these features

*HPV — the two-fisted fire-fighter with both High Pressure Fog and Volume pumps (plus John Bean High-Pressure Sno-Foam at low extra cost).

TRUE HIGH-PRESSURE AND MULTI-STAGE PUMPS OPERATE SIMULTANEOUSLY

Operate them together or singly — the John Bean High-Pressure Fog piston pump, delivering 60 GPM at 850 PSI pump pressure — and the John Bean centrifugal volume pump, providing a smooth flow at 500, 600 or 750 GPM.

DUAL BATTERY SYSTEM
Auxilliary battery insures against starting failures.

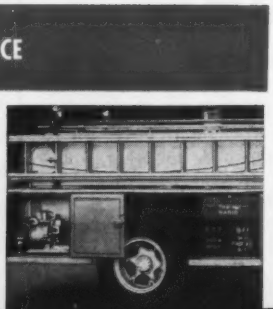
VACUUM-OPERATED PUMP SHIFT
Quick, positive, trouble-free shifting of volume pump.

THE PATENTED JOHN BEAN FIRE-FIGHTER GUN

The fireman has perfect control of stream patterns with this famous gun. Instant on-and-off control of discharge with one hand — other hand rotates barrel for a complete range of fog patterns. Face-protector spray allows fast, close approach to hot fires. Hose extending from back of gun provides straight-flow waterway for best performance and easiest handling.

OVER 45 CUBIC FEET OF WEATHERPROOF STORAGE SPACE

Four lighted compartments are built in — one tailored for slide-mounted generating equipment; another for portable water pump. Plus a rear compartment for smaller fire department fire accessory tools.



This two-fisted fire-fighter stops fires faster!

The "HPV" gives you two lines of fast-striking John Bean High-Pressure Fog . . . the *original* high-pressure fog . . . discharged from the guns at 600 to 700 PSI nozzle pressure. Only this true high-pressure fog has such effective triple action — to cool, to smother, to isolate flames in seconds — with 90%

WINTERIZED REEL COMPARTMENTS

Removable enclosures winterize the two reel compartments. These, as well as pump, valves, gauges and controls, are warmed by engine heat.

POWER REWIND HOSE REELS

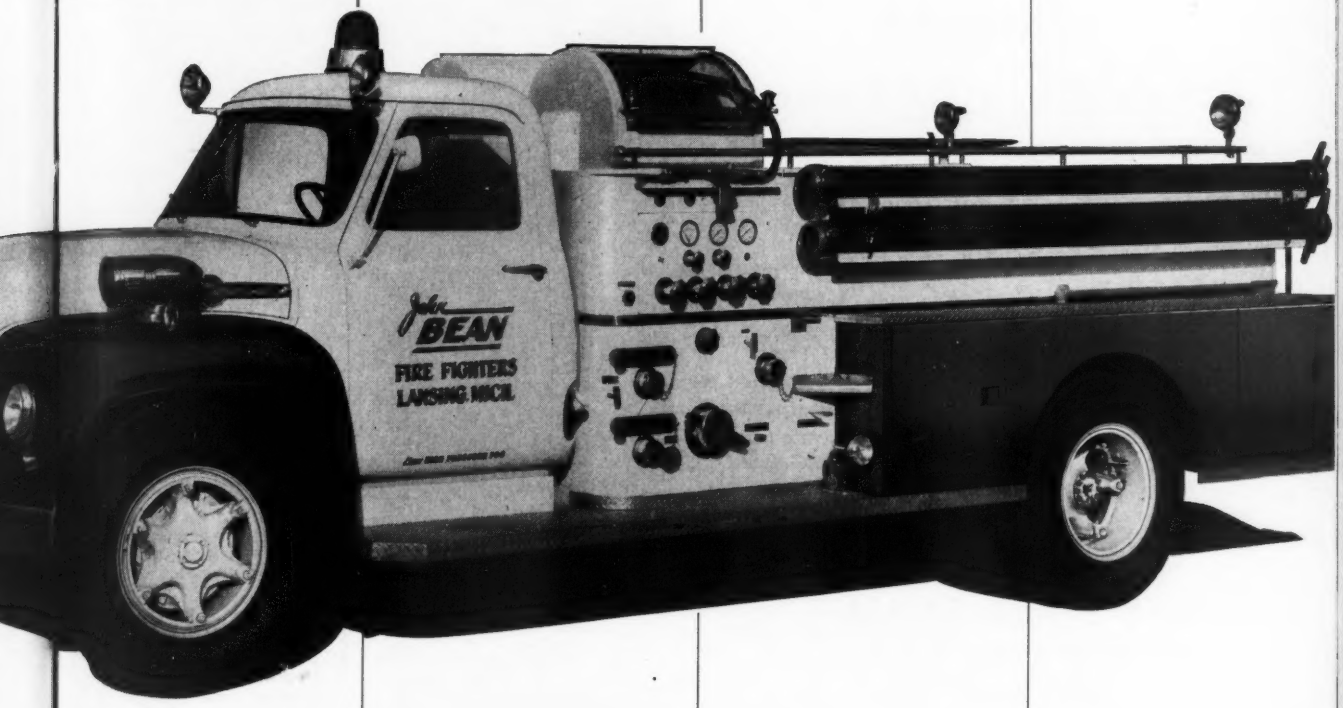
Faster, easier hose pick-up with power operated reels. Hose lays out smoothly and easily over roller guides.

400 FEET OF HIGH-PRESSURE HOSE

The 200 feet of special, 3500 pounds burst test hose on each reel can be easily handled by one man.

SPACIOUS HOSE BED

Smooth, level hose bed is properly ventilated, carries 1200 feet of 2½-inch and 400 feet of 1½-inch volume hose.



ILLUMINATED CONTROL PANEL

All gauges, valves and controls are centralized for instant operation — illuminated for safety and easy reading at night.

BONDED-TO-METAL FINISH

For longer life and better paint finish, a special corrosion-resistant process is used on all metal surfaces.

40 FEET OF SUCTION HOSE

Standard equipment includes two 10-foot lengths each of 2½-inch and 4½-inch hard suction hose, complete with hydrant adapters and suction screens.

500-GALLON, 10-GAUGE STEEL TANK

Smooth cornering, starts and stops assured by six-compartment tank with low center of gravity. Prevents undesirable water surge.

ASSI - John Bean Fire-Fighters can be mounted on most standard truck chassis

less water damage. Fire extinguishing value of water is increased by a ten-to-one ratio — makes the 500 gallons of water on the truck go ten times further.

Add to this, the truck's multiple lines of hard-slugging, Underwriters' approved volume streams and you have an unbeatable combination. Two great John Bean pumps . . . two proven methods of fire-fighting. Use them separately or both at the same time — in any combination. And for fighting grass and brush fires, use high-pressure fog while the truck is in motion.

Because they're designed by firemen . . . men who've fought fire under all kinds of conditions . . . John Bean equipment is designed right for ease of operation. Arriving at a fire, you're in business with four easy steps. Put pump in gear, step out of cab, open valve, adjust throttle for RPM — and presto! your lines are ready for instant action.

The proof is in the doing.

See for yourself what a John Bean HPV Fire-Fighter will do for your community's fire safety. In Lansing, Michigan, you'll get expert instruction and actual practice in volume and high-pressure fog methods at John Bean's Fire-Fighting School. In the meantime, why not contact your local John Bean representative, or write factory direct. In many localities, a demonstration can be arranged for you.

ASK FOR THE JOHN BEAN HPV CATALOG

JOHN fmc® BEAN

Dept. 126
Lansing 4, Michigan

P.O. Box 145
San Jose 3, California

ROCKWOOD
built-in proportioning systems for municipal fire trucks

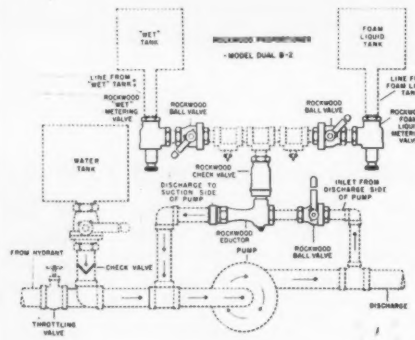
Rockwood's long, practical experience and constant research assures you the safest, most economical means of fighting all types of fires. These pages illustrate a few of Rockwood's family of products that are playing a vital part in fire fighting programs throughout America.

Rockwood's new Double Strength FOAM and Rockwood WET offer you many advantages

Double Strength FOAM has double foam-making capacity, cutting in half the transportation cost and storage space. It is faster spreading and flows freely — even at subzero temperatures. An outstanding FOAM liquid to go with Rockwood's advanced type of FogFOAM and FOAM Nozzle for quickly putting out fires in gasoline and other similar flammable liquids. Available in 5 gallon cans or 50 gallon drums.

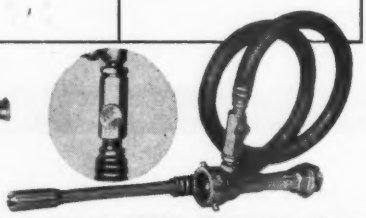
Rockwood WET increases the spread and penetration of water into deep seated fires involving ordinary combustibles such as wood, paper, cloth, etc. It greatly reduces the water needed to extinguish such fires. Available in 50 gallon drums, 5 gallon and 1 gallon cans.

Regular FOAM and All Purpose FOAM are also available.

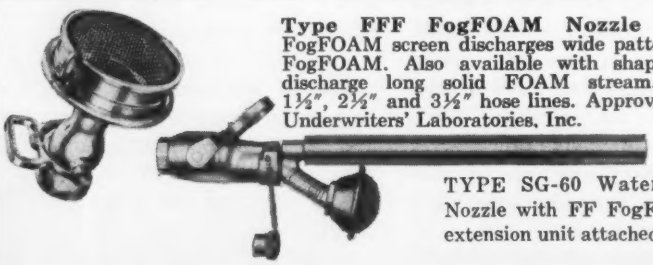


Proportioning System. Model B-2, around-the-pump proportioner. Used when pressure is maintained by pump. Custom-engineered systems are also available.

The F-501 Nozzle developed for use with 1½" hose to provide an economical means of applying a solid stream of FOAM on flammable liquid fires.



The Variable FW Metering-Check Valve with FW Eductor incorporates both the Metering Valve and Ball Check Valve in one unit and meters material into the hose line in any proportion from 1% through 6%.



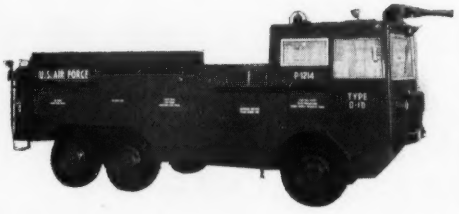
Type FFF FogFOAM Nozzle with FogFOAM screen discharges wide pattern of FogFOAM. Also available with shaper to discharge long solid FOAM stream. For 1½", 2½" and 3½" hose lines. Approved by Underwriters' Laboratories, Inc.

TYPE SG-60 WaterFOG Nozzle with FF FogFOAM extension unit attached

Rockwood offers you 4 types of turret control

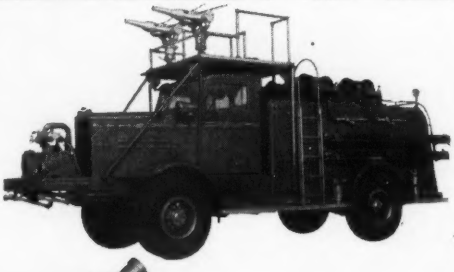
...and any Rockwood turret gives you 4 types of discharge (1) FogFOAM, (2) Solid FOAM stream, (3) WaterFOG,(4) Solid water stream

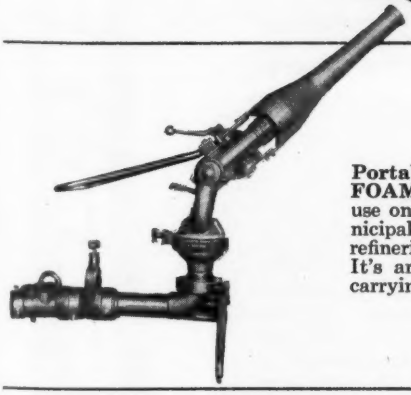
Remote Hydraulic Control Single Type FFF FogFOAM Turret Nozzle on Type 0-10 U. S. Air Force crash rescue fire fighting truck. Similar turrets can be supplied for oil refineries, chemical and industrial plants and municipalities. Hydraulically operated dual turrets also available.



Remote Manual Control Type FFF FogFOAM Turret Nozzle provides efficient operation of turret from driver's seat within truck cab — for small municipalities, airports or industrial properties where limited personnel is available.

Direct Manual Control Dual Type FFF FogFOAM Turret Nozzles — can be operated directly by firemen from cab roof.

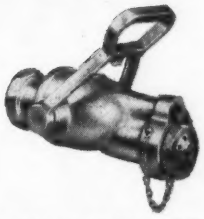




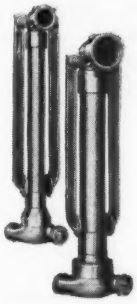
Portable Type FFF FogFOAM Turret Nozzle for use on fire hose lines by municipal fire departments, oil refineries and industrial plants. It's arranged for convenient carrying on fire trucks.

ROCKWOOD

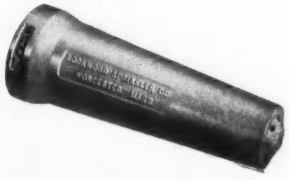
WaterFOG Equipment



Type SG-48 WaterFOG Nozzle. Easy to handle. Discharges high or low velocity WaterFOG or straight water stream.



Lightweight Rotating Cellar and Attic Pipe. Fights fires in cellars, attics, under piers, bridges, etc.



Type N22 WaterFOG Nozzle. Discharges high velocity WaterFOG. For general use around live electrical equipment.

Type N23 WaterFOG Nozzle with Swivel Handles. Discharges high velocity WaterFOG with higher discharge and greater range than Type N22 Nozzle.

ROCKWOOD SPRINKLER COMPANY

Engineers Water . . . to Cut Fire Losses

PORTABLE FIRE PROTECTION DIVISION

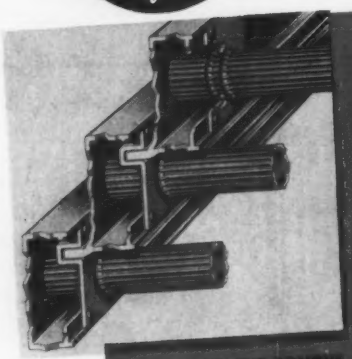
1545 Harlow Street, Worcester 5, Massachusetts

Distributors in all principal cities

MORE TO CHOOSE FROM!

DUO Safety

ALL ALUMINUM FIRE LADDERS



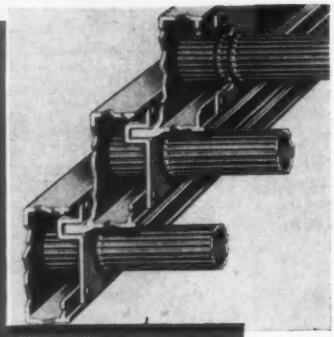
SERIES 1000-A FOR PUMPER USE

Newest in the Duo-Safety All-Aluminum line... has the identical construction features, except in lighter weight, as the 900-A Series, and is a substitute for the famous 700-A Series. Lightweight Channel Rail construction—requires minimum of banking height—and outstanding tongue and groove arrangement that holds sections together firmly and rigidly, with no obstructions! In two and three sections...in lengths up to 30 feet. Rail Dimensions—1¼" x 2¾"

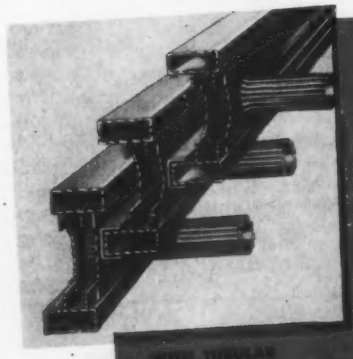
WITH EXCLUSIVE TONGUE AND GROOVE CONSTRUCTION

SERIES 900-A FOR PUMPER AND SERVICE TRUCK USE

Replacing solid side wood ladders, the 900-A Series features slightly heavier construction than the 1000-A Series, and has the same outstanding construction. In two and three sections...in lengths up to 40 feet. Rail Dimensions—1¼" x 3¼".



WITH EXCLUSIVE TONGUE AND GROOVE CONSTRUCTION



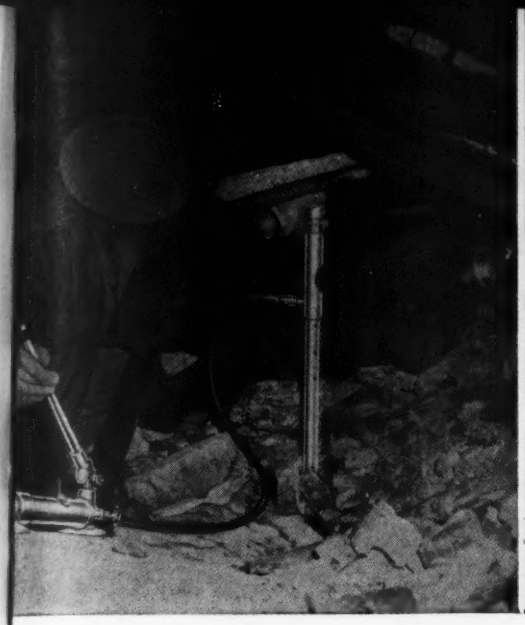
SERIES 500-A FOR SERVICE TRUCKS

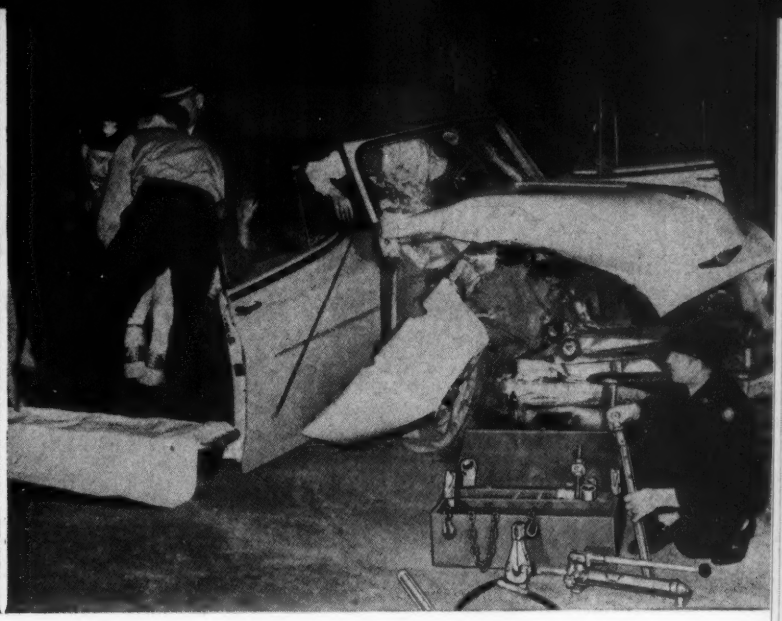
Famous aluminum fire ladder that replaces wood truss ladders and features Tubular Rail construction for greater strength and extraordinary safety. Adopted as standard ladder equipment by fire departments the country over, Series 500-A is made in roof ladders, wood ladders and in two and three section extensions in all standard ladder sizes. Write for complete specifications.

WITH TUBULAR RAIL CONSTRUCTION

DUO-SAFETY LADDER CORPORATION

809 NINTH STREET
OSHKOSH, WISCONSIN





At last! Fast, Safe, Powerful . . .

Hydraulic Rescue Equipment

When seconds are critical . . . BLACKHAWK

Porto-Power helps you save lives, protect property

These time-proven hydraulic power tools spread, bend, push, press, lift and pull to instantly force entry . . . free trapped victims

At last there exists a full line of *hydraulic power tools* specifically selected and tested for all types of emergency rescue work!

This timely development can be credited to the many fire chiefs, sheriffs and other public and industrial safety experts who have proved the sensational efficiency of Blackhawk hydraulic "Porto-Power" for rescue purposes. Through the years, these men had been inspired to adapt "Porto-Power" to emergency rescue work because they had witnessed the miracle of power and flexibility performed by this equipment in other applications. Their urging and assistance have now led to the following:

Six "Rescue Kits" have been scientifically developed — in 4, 10 and 20-ton "power packages" — complete with "Porto-Power" remotely controlled hydraulic jacks and versatile attachments.

WHY IS THIS IMPORTANT? Think back to fires and accidents in your experiences . . . recall when victims were hopelessly trapped in wrecked vehicles or under debris. Think how rescuers struggled with hacksaws, prybars, torches, etc., sometimes losing the race against fire and death! Think how this modern, *fast* "Porto-Power" rescue equipment could have done the job in swift seconds instead of in agonizing long minutes or hours. Act today — learn how "Porto-Power" can help in your important role of protecting lives and property.

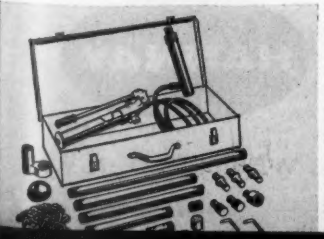
FOR A DEMONSTRATION — call your nearest Blackhawk representative. He's your local automotive, industrial or fire equipment distributor. Blackhawk Rescue Manual HR300 has been mailed to every fire chief. If you haven't received your personal copy, write us.

BLACKHAWK

Worlds largest manufacturer of HYDRAULIC TOOLS

BLACKHAWK MFG. CO., Dept. H-64106 • Milwaukee 46, Wisconsin

"Porto-Power" kits contain remotely-controlled hydraulic jack, spreaders and attachments.



Easy to set up, use! "Porto-Power" assembles in seconds. Hundreds of combinations.

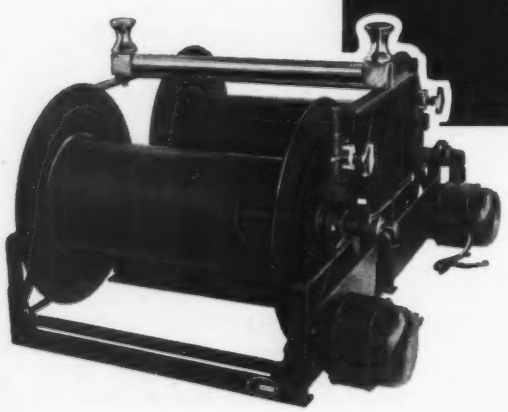
Light, easy to carry. Take "Porto-Power" anywhere. Self-powered. Develops tons of force.

Works near gasoline and fumes. Eliminates sledging, etc., minimizes spark hazard.

When you want the best, SPECIFY...

HANNAY FIRE HOSE REELS . . . HANNAY FIRE HOSE REELS . . .

HANNAY



Built *by* firemen *for* firemen, Hannay Hose Reels have served so faithfully for over twenty years that they are accepted as the standard of quality by thousands of firefighters.

Your men and your equipment deserve the finest. Make sure they *get* it. *Specify* Hannay Fire Hose Reels.

Sustaining Member

Write for free 16-page catalog of complete line.

. . . Greatest Name in Hose Reels

HANNAY®

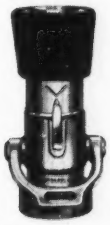
© 1960 C.B.H.&S., Inc.

CLIFFORD B. HANNAY & SON, INC., 666 OAK ST., WESTERLO, N.Y.

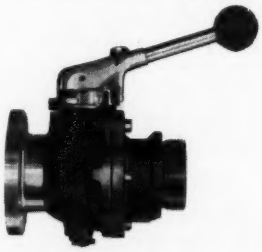
1 *look to* ELKHART FOR LEADERSHIP *and to many "firsts" that prove it...*

X-Trude Coupling

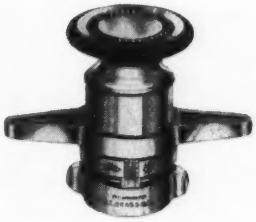
Elk-Air Air Pressurized
Water Fire Extinguisher



Select-O-Stream
Mystery Fog Nozzle

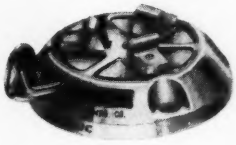


2½" Quarter Turn
Ball Type Valve

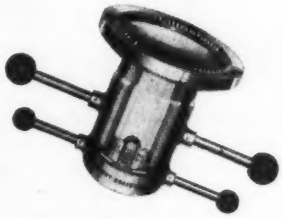


Jumbo Mystery Fog Nozzles

Apparatus
Suction Gate Valve



Tri-Loc
Nozzle Holder



JK 2500 Jumbo King
Mystery Fog Nozzle

More than half a century of fire fighting progress

ELKHART BRASS MFG. CO., Inc.

ELKHART, INDIANA

MIDWESTERN

Safety Clothing for FIREMEN

The Original
STRIPED SAFETY COAT

- ☆ ***New Yellow Rubber Stripes!***
- ☆ ***Maximum Visibility!***
- ☆ ***Maximum Durability!***
- ☆ ***Exclusive Safety Features!***

YOU deserve the BEST PROTECTION OBTAINABLE for your hazardous work of protecting life, and property against fire. The Mackinaw Safety Coat with new yellow stripes is the answer! Highly visible stripes are rubberized as part of the material . . . not painted, glued or sewed on. Tests indicate that the new yellow, like black, retains its natural color and has the same durability.

There are many imitations but no substitute for the superior quality, design, fabric texture and safety features you get by specifying MIDWESTERN!

MIDWESTERN
COMBINATION SAFETY SUIT

The Midwestern Rubberized Coat and Bunker Pants make it easy for firemen to keep both warm and dry even in the most severe weather. Close fitting collar and elastic inner sleeve keep out sparks and water. Detachable wool lining. Pants have double-stitched seams, reinforcing rivets at points of strain, large roomy pocket space.

For complete information on our full line of safety clothing for firemen, see your Midwestern dealer. A letter to the factory will also bring you literature and materials for your inspection.

NONE GENUINE WITHOUT THIS TRADE MARK

MIDWESTERN SAFETY MFG. CO. Mackinaw, Illinois

Manufacturers of the Famous **MACKINAW Safety Coats**

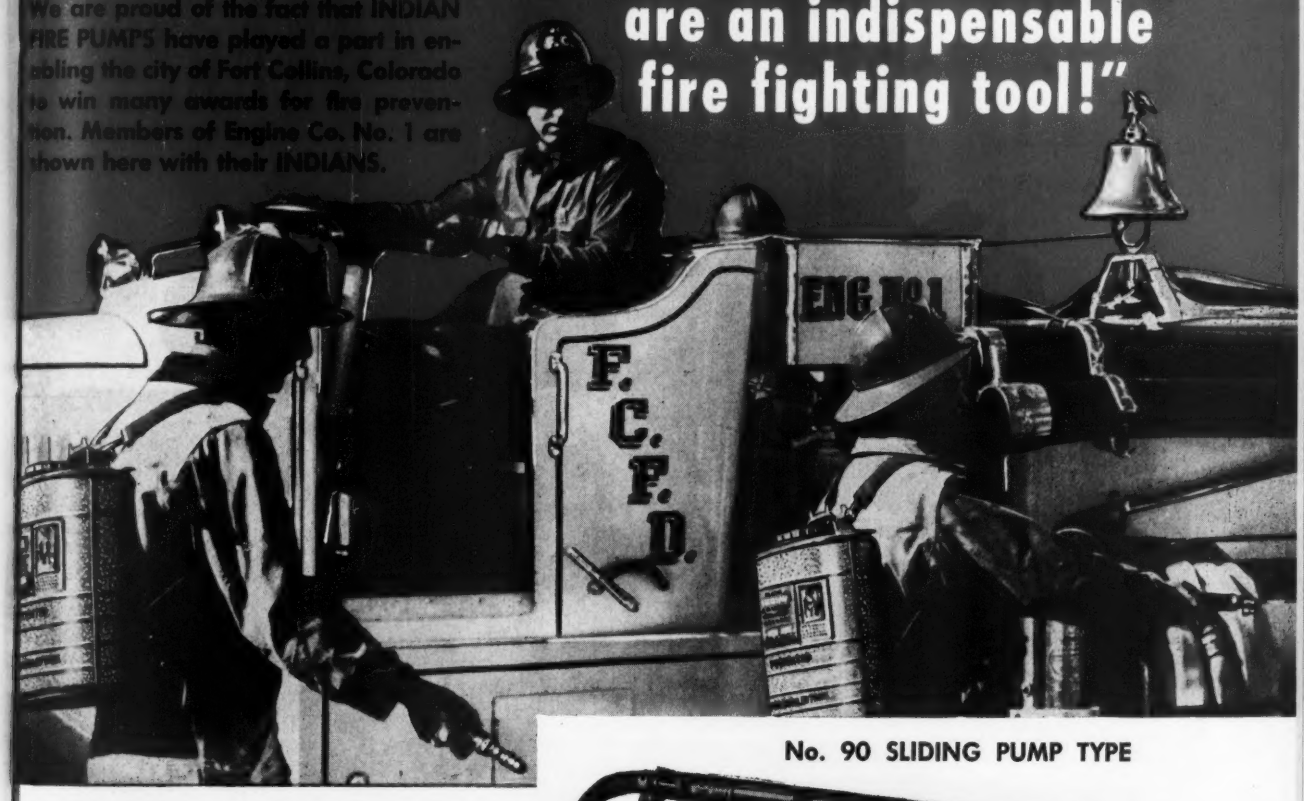
Chief T.P. Treadwell of Fort Collins, Colorado

(Winner of 1st place in fire prevention in cities of less than 20,000)

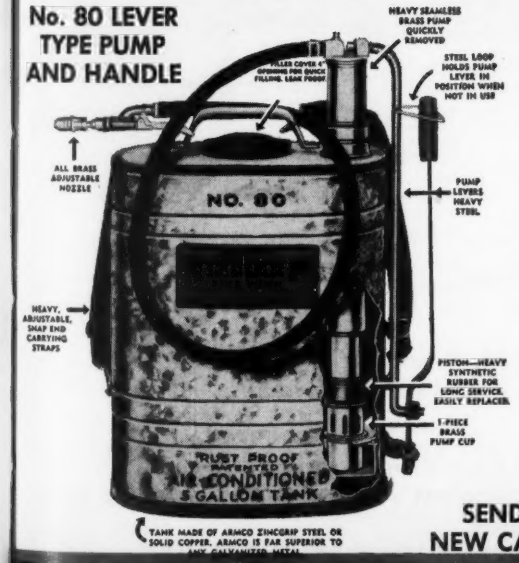
SAYS:

"INDIAN FIRE PUMPS are an indispensable fire fighting tool!"

We are proud of the fact that INDIAN FIRE PUMPS have played a part in enabling the city of Fort Collins, Colorado to win many awards for fire prevention. Members of Engine Co. No. 1 are shown here with their INDIANS.

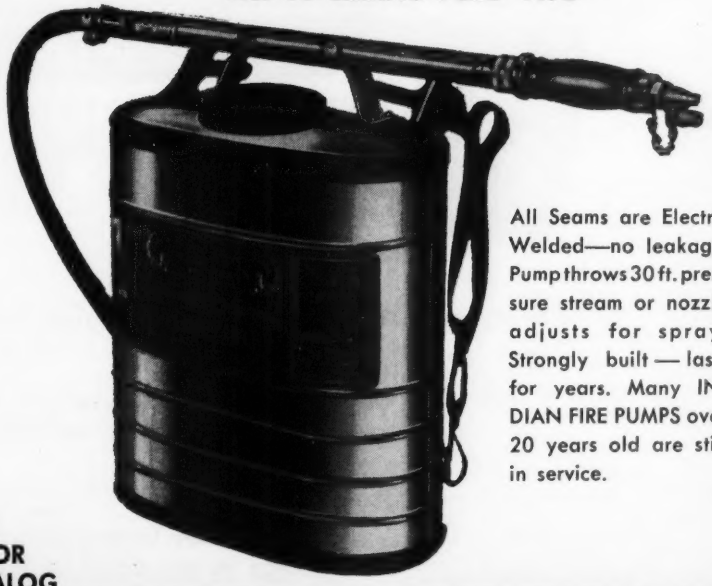


No. 80 LEVER TYPE PUMP AND HANDLE


HEAVY SEAMLESS BRASS PUMP QUICKLY REMOVED
STEEL LOOP HOLDS PUMP LEVER IN POSITION WHEN NOT IN USE
ALL BRASS ADJUSTABLE NOZZLE
PUMP LEVERS HEAVY STEEL
NO. 80
HEAVY, ADJUSTABLE, SNAP END CARRYING STRAPS
PISTON—HEAVY SYNTHETIC RUBBER FOR LONG SERVICE, EASILY REPLACED
1-PIECE BRASS PUMP CUP
"RUST PROOF" PATENTED AIR CONDITIONED 5 GALLON TANK

TANK MADE OF ARMCO ZINCGRIP STEEL OR SOLID COPPER. ARMCO IS FAR SUPERIOR TO ANY GALVANIZED METAL

No. 90 SLIDING PUMP TYPE



All Seams are Electric Welded—no leakage. Pump throws 30 ft. pressure stream or nozzle adjusts for spray. Strongly built — lasts for years. Many INDIAN FIRE PUMPS over 20 years old are still in service.

SEND FOR NEW CATALOG

D. B. SMITH & CO.

"FOR 70 YEARS THE LEADER"

Utica, N. Y.

Hercules Equipment & Rubber Company, Inc. San Francisco 7, Calif.
Halprin Supply Co.

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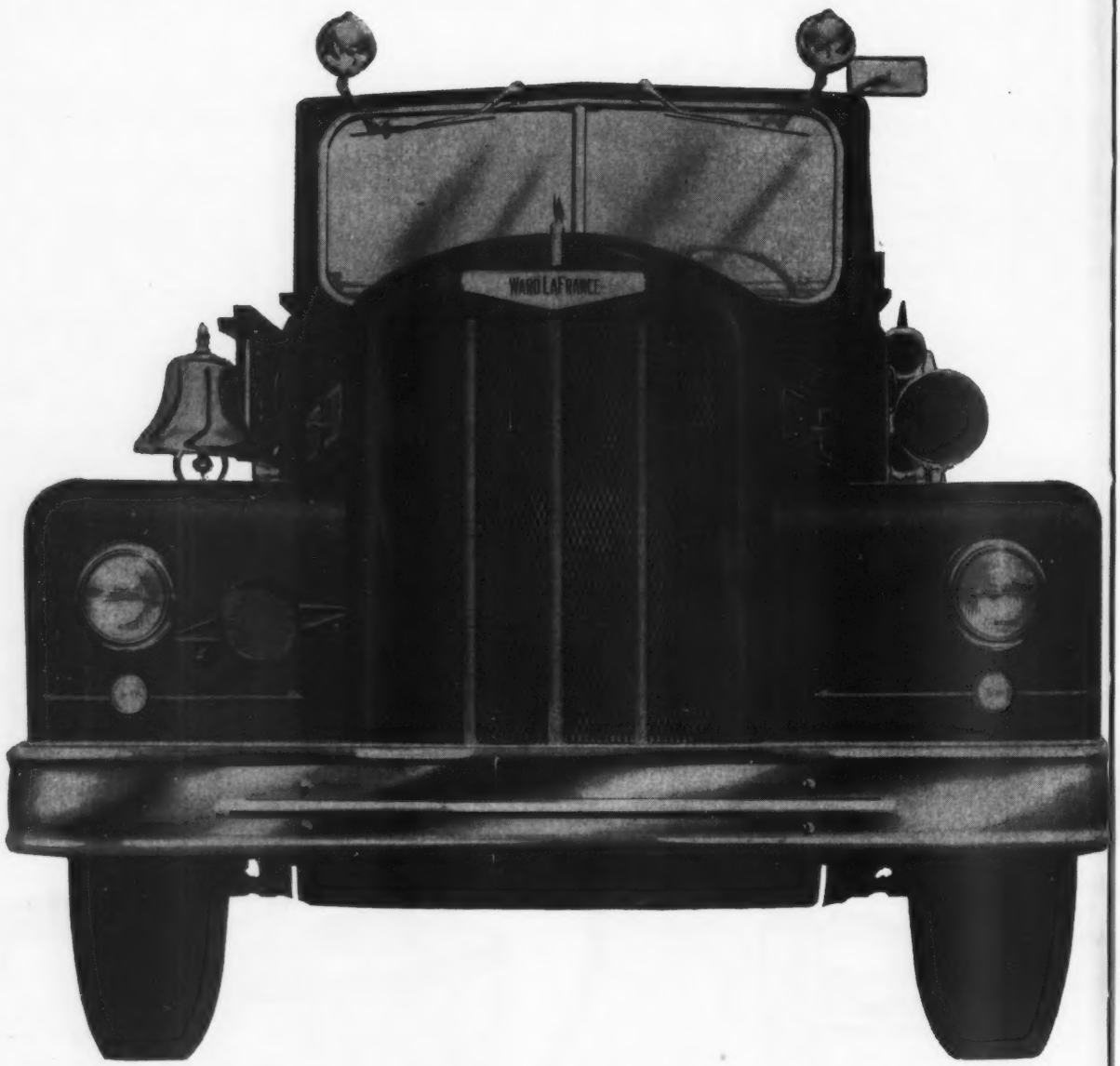
Pleck Bros. Limited Vancouver, B. C., Canada
C. E. Hickey & Sons, Ltd. Hamilton, Ont., Canada
Bison Hardware Co.

Look what's new



● **NEW styling** . . . beautiful, functionally-styled fire fighter.

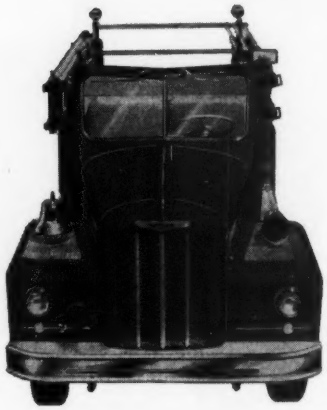
● **NEW performance** . . . powerful new 270 H. P. engine . . . electro-matic pump with push-button controls . . . shorter turning radius.

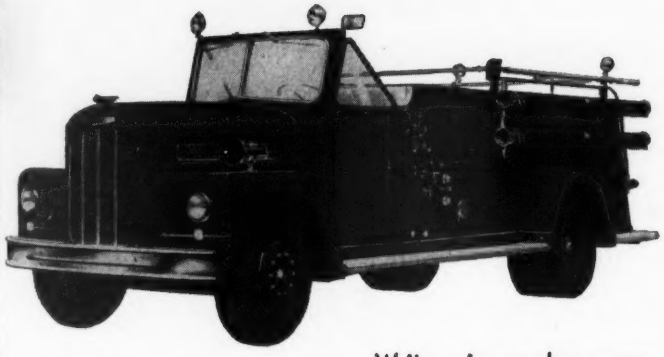
● **NEW features** . . . bus type front axle . . . shorter wheelbase . . . larger, fully waterproofed equipment compartment over pump with large access doors on each side.

for 1957

from

WARD LaFRANCE





Write, wire or phone your Ward LaFrance representative . . . or contact us direct for full details!

WARD LaFRANCE TRUCK CORPORATION

Fire Apparatus Manufacturers for over 38 Years

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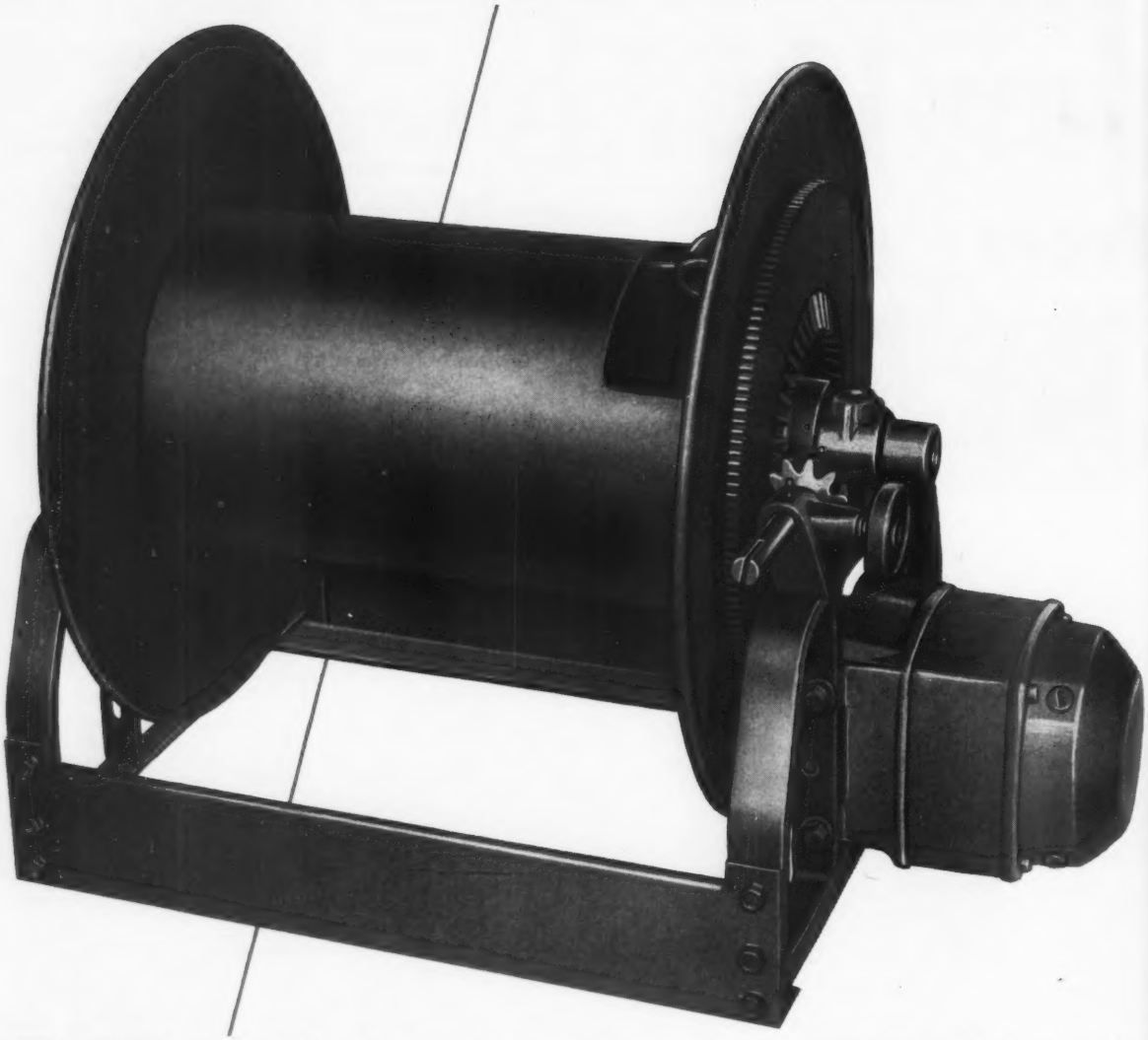

THANK YOU

Your increasing preference for Ardmore Reels is deeply gratifying to us. For we spare no effort to build into these better reels the swift, smooth, sure performance modern fire-fighting demands.

Ardmore Fire-Fighting Reels are now available in explosion-proof, starter-motor, and hand-wind models...single or dual ...with or without hose rollers. All models are competitively priced. Complete catalog on request. Write, wire or phone:

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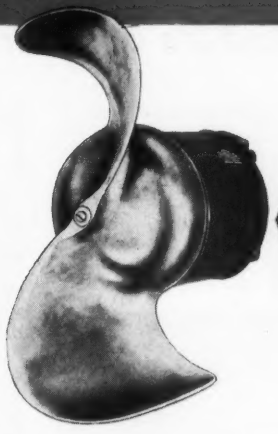
Super Vacuum ..... THE ANSWER TO YOUR SMOKE EJECTION PROBLEMS

● REVOLUTIONARY NEW PRINCIPLE INCREASES FIRE FIGHTING EFFICIENCY!

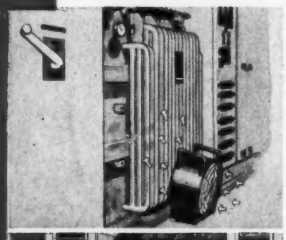
The Super Vacuum Smoke ejector is a powerful portable fan unit designed especially for fire departments. This design is a new and revolutionary principle in moving air. Several thousand Super Vacuum Smoke ejectors are in use throughout the United States and Canada. Controlled ventilation is new and very necessary in fire fighting. Years of service and satisfied users are your best guarantee for any merchandise.



THE HEART OF THE SUPER VACUUM

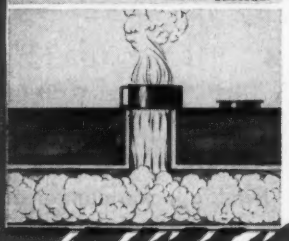
● The secret of Super Vacuum is the patented fan blade. Conventional fans chop the air and push it back. Whereas the Super Vacuum fan blade is a perfect spiral air screw which creates a partial vacuum, suction is created over the entire face of the blade and the air or smoke is discharged in a high velocity spiral. There are no dead spots—that is why Super Vacuum outperforms other fans twice its size.

TYPICAL USES

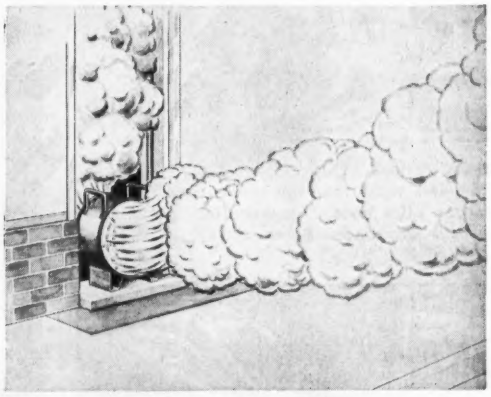


● Super Vacuum ejectors are often used by fire departments in emergencies to cool generators, pumps and motors. The strong discharge of air quickly reduces the temperature to a safe level.

● Fresh air can be forced into a building with or without a deodorant. By applying deodorant to a pad and attaching it to the intake face of the Super Vacuum fan, air is pulled through this pad and forced throughout the building. Smoke odors are dissipated and soot is settled.



● Poisonous or explosive gases can be effectively removed from sewers, basements, tunnels and mine shafts with the Super Vacuum Fans. They can be used in any position horizontal or vertical.



● Smoke ejection is a major problem at most fires. Super Vacuum does it faster, cheaper and more efficiently than any similar device on the market. As a Nationally known Fire Chief said recently, "Smoke ejectors are as necessary as fire hose in fighting a fire."

Write for Additional Information or Contact Your Local Fire Equipment Dealer

MANUFACTURED EXCLUSIVELY BY

Super Vacuum MANUFACTURING CO., INC.

3191/2 East 17th Avenue • Denver 3, Colorado

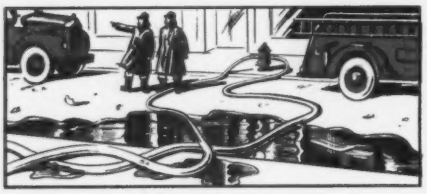
NOW! 1½ INCH DOUBLE JACKET MUNICIPAL FIRE HOSE in 100-FOOT LENGTHS!

It's new "Quaker 100"—a 600 lb. hose. And it's quick drying, easy to pack and fold

● "Quaker 100" is made from extra-long staple cotton, chemically treated to keep its flexibility and reduce elongation. It is exceptionally light and strong.

LIGHT WEIGHT. One coupled length of "Quaker 100" weighs only 34½ lbs., as opposed to a weight of 51 lbs. for two coupled 50-foot lengths of our popular Delaware brand.

EXTRA STRONG. The specially treated cotton, which supports the "Dacron" filler cords, provides at least 10% more strength in each warp strand woven into the jacket. (Average burst pressure per three foot length is 1200 lbs.)



QUICK DRYING. "Quaker 100" actually absorbs 25% less water than the conventional 600 lb. dacron filler hose. "Quaker 100" packs and folds in less time and space.

GOES INTO ACTION QUICKLY. 100 feet long, "Quaker 100" reduces by 50% the danger of couplings pulling off or becoming snagged. The hose "corners" easily.

"SMOOTH-AS-GLASS" WATERWAY. The close picks per inch of the weave reduce friction loss to a minimum (as do 50% fewer couplings).

One look at new "Quaker 100" Double Jacket municipal fire hose is all you'll need to see the savings . . . to see how easy it is to use and maintain. Why not take that look soon?

If you'd like the name of the Quaker or Quaker Pioneer Distributor nearest you, just write. He can save you time, trouble and money. Write, too, for free brochure on "Quaker 100".

Quaker HKP

H. K. PORTER COMPANY, INC.
QUAKER RUBBER DIVISION
PHILADELPHIA 24, PA.
QUAKER PIONEER RUBBER DIVISION
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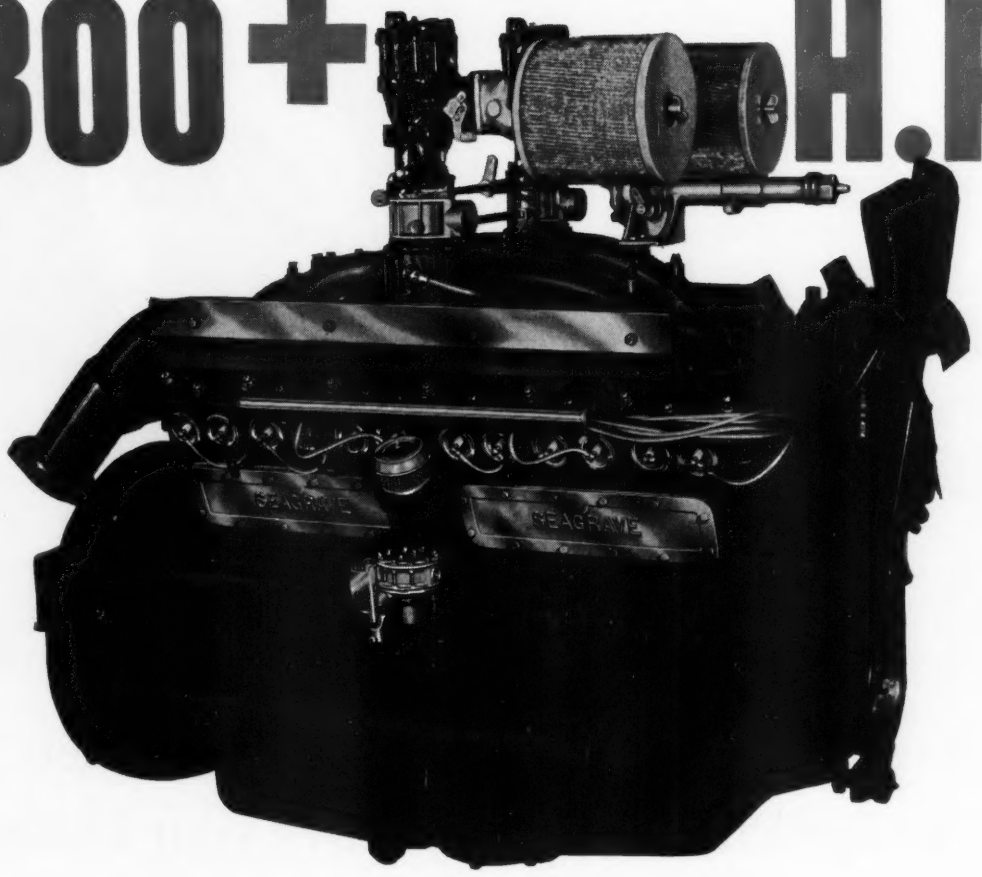
Seagrave V–12 300+ H.P.



The Most Powerful Engine Made Exclusively For Fire Service!

An abundance of unfailing, dependable power is a vital necessity for modern fire service . . . And the new Seagrave 300+ H.P. V-12 is proving it can deliver such power effortlessly and for hour after hour . . . This mighty engine was designed by Seagrave engineers and is built by Seagrave skilled mechanics exclusively for Seagrave Fire Apparatus. It is guaranteed by Seagrave and is Seagrave serviced throughout its entire lifetime.

This new Series 900 V-12 naturally outclasses and outperforms any other engine in fire service. It is the result of Seagrave's more than twenty years experience in producing V-12's. It is another indication of Seagrave's unchallenged leadership.

THE SEAGRAVE CORPORATION
Columbus, Ohio

SEAGRAVE—THE GREATEST NAME IN FIRE APPARATUS

Let this "Visiting Fireman" train your men to fight fire . . . it could save your business

You have a *potential* fire-fighting team right in your plant. These would-be fire fighters *could save your business if fire struck unexpectedly*. All they need is training, the kind that will enable them to respond instantly and properly to any kind of fire emergency.

Ansul can provide this training for a group of your men just as it has for hundreds of its customers. And there will be no charge. It is just one of the "essential" services that Ansul provides for its customers.

Twenty years experience in the fire protection industry has proved to Ansul many times over that all the fire equipment in the world will not save your business *unless* trained hands are available to man that equipment. So, it is important to Ansul that you get *training* along with the fire equipment you buy. Only then will you experience the security that goes with having a complete fire protection program. Only then will you get what you really pay for, what you really need—*complete fire protection*.

You owe it to the life of your business to learn more about Ansul's in-plant fire training service. Get in touch with your local ANSUL MAN through the yellow pages of your phone directory, he will be happy to call on you and explain all of Ansul's customer services in detail. Or write to THE ANSUL CHEMICAL COMPANY, Dept. FE-10, Marinette, Wisconsin.

ANSUL

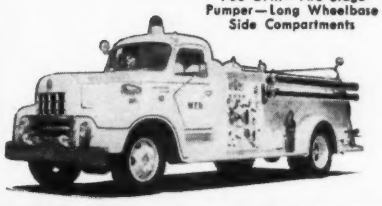
BOARDMAN PUMPERS

...engineered for YOUR Community!

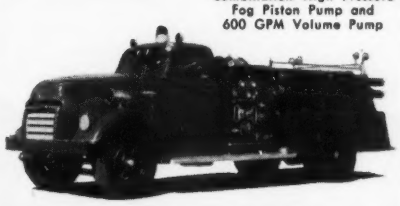
Your community deserves the best . . . and the best is a Boardman Pumper unit. Designed for any size city, Boardman Pumpers offer the most efficient, economical fire protection it is possible to buy. Equipped with dependable Waterous pumps, these units will give years of trouble-free service. Available with pump capacities of 200, 500, 600, 750 or 1,000 GPM. Your unit can be designed with special booster tanks, compartments, or equipment built to your specifications. Dependable . . . and economical, that's a Boardman Pumper. It can be mounted on the standard chassis of your choice or on a Boardman custom unit. Write today for complete information! Learn how your community can have economical Fire Protection with a Boardman Pumper unit.

They're efficient!
They're attractive!
They're economical!

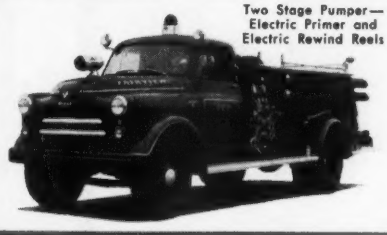
750 GPM—Two Stage Pumper—Long Wheelbase Side Compartments



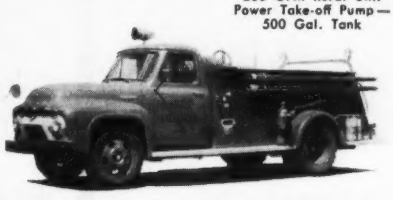
Combination High Pressure Fog Piston Pump and 600 GPM Volume Pump



Two Stage Pumper—Electric Primer and Electric Rewind Reels

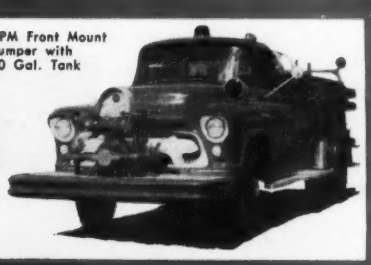


200 GPM Rural Unit Power Take-off Pump—500 Gal. Tank



750 GPM Custom Pumper 240 H. P. Dual Ignition Waukesha Engine

500 GPM Front Mount Pumper with 500 Gal. Tank



MANUFACTURING DIVISION

THE BOARDMAN CO.
OKLAHOMA CITY
1401 SOUTHWEST 11TH
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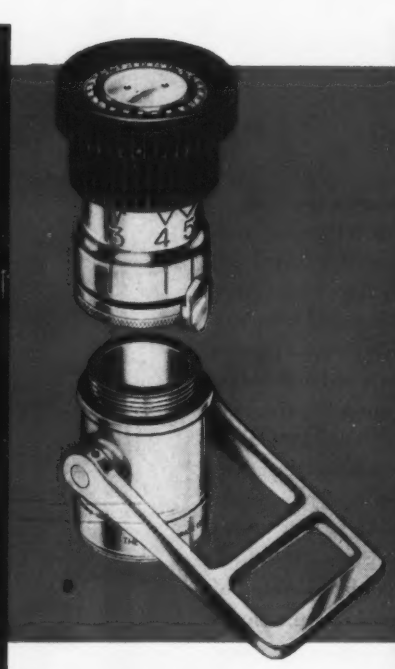
MANUFACTURER OF DEPENDABLE PUMPERS AND TANKERS

SPECIFY WOOSTER

for dependability . . . top performance

FAMOUS VARI-A-FOG NOZZLE . . .

Does everything you want a nozzle to do—more effectively, faster, easier. The answer to every fire fighting situation is right at your fingertips. Five positive click-stop settings give you a full choice of dense fog patterns or a solid straight stream. Available in 1", 1½" and 2½" sizes with a wide choice of GPM ratings. Easy-acting, non-locking ball shut-off. Beautifully engineered, precision built—a joy to use.

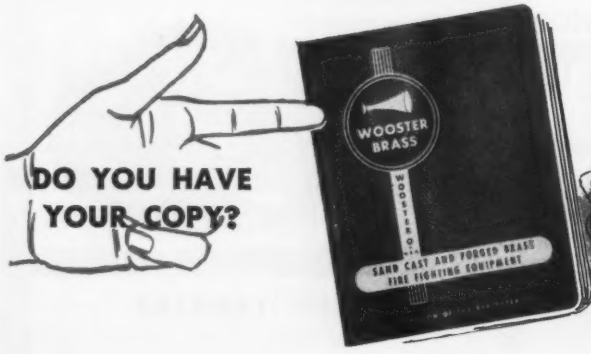


WOOSTER'S NEW VARI-A-FOG BREAK-APART NOZZLE

Fire fighting engineers like the versatile features incorporated in this nozzle. Break-apart permits adding line or applicator without shutting down at pump. Your choice of threads between ball shut-off and dial stream control unit. Without ball shut-off it is still a complete fire-fighting unit because barrel will shut off water when turned below straight stream setting. Available in 1", 1½" and 2½" sizes.

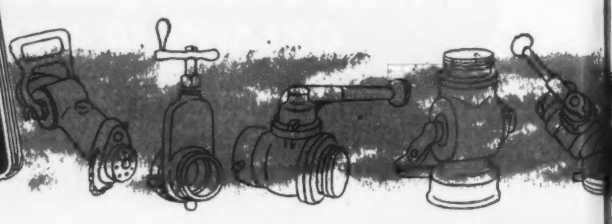
WORM AND GEAR CONTROLLED LADDER PIPES

Completely redesigned for lowest friction loss. Now made of lightweight aluminum alloy for faster and easier handling. New eccentric, snap-on ladder locks mean positive attachment without fumbling. Easy horizontal positioning from ladder. Ball bearing swivels for vertical positioning from ladder or ground. Stays in any set position. Also available in hand-operated model.



Here's real help in selecting your equipment

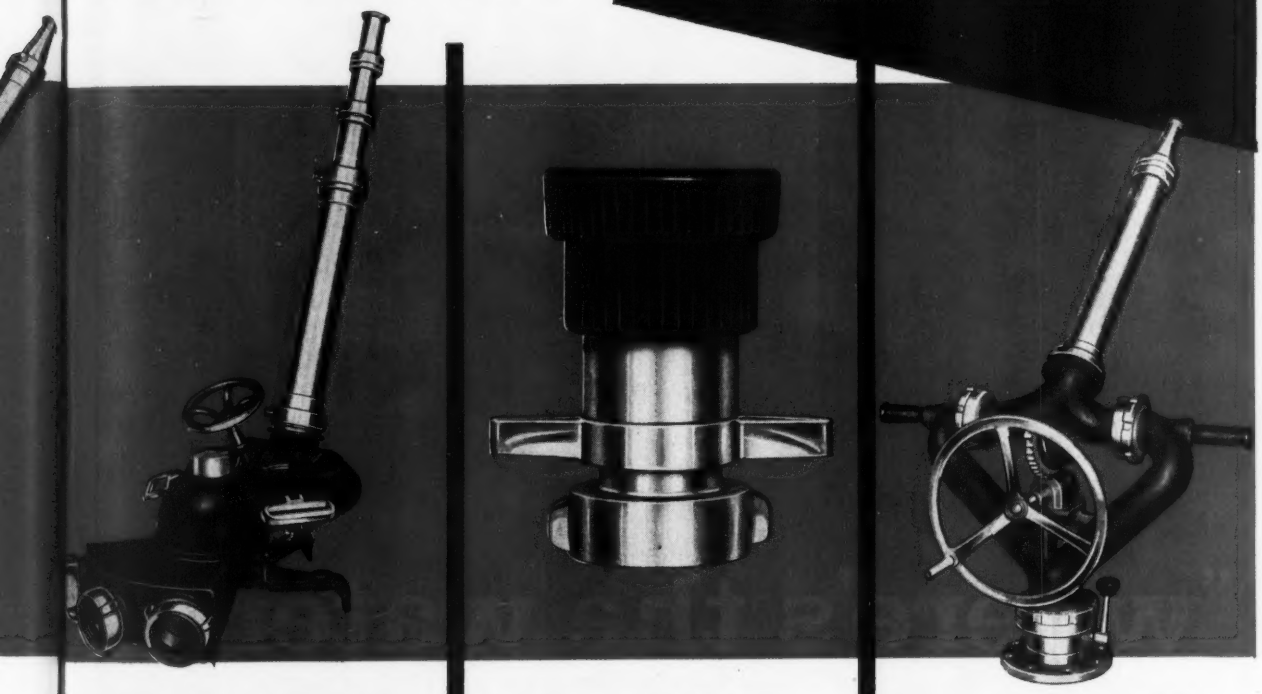
Hundreds of fire chiefs and instructors labeled this the most helpful fire equipment catalog ever published. For your copy just send your request giving us your name, address and title.



R BRASS!

ce widest selection

for all your FOG NOZZLE and DELUGE NOZZLE requirements



3-INLET, GEAR OPERATED PORTABLE DELUGE NOZZLE

By actual test, Wooster deluge nozzles have less friction loss. Low center of gravity design assures "stay-put" service at any angle without attention. Smooth ball-bearing operation through 360° rotation and 20° to 90° elevation. Use from one to three hose lines. Automatic check valves close ports not in use. Top-of-truck and running board mounts available. (Also available in two and four inlet style.)

WOOSTER FOG MASTER FOR VOLUME STREAMS

Another precision-built Wooster nozzle to meet the growing demand for fog discharges on master streams such as deluge nozzles and ladder pipes. Also used with direct connection hand grip on 2½" hose with high GPM discharge. Provides a full range of dense fog patterns by simply turning barrel. Available in 500 GPM and 1000 GPM ratings.

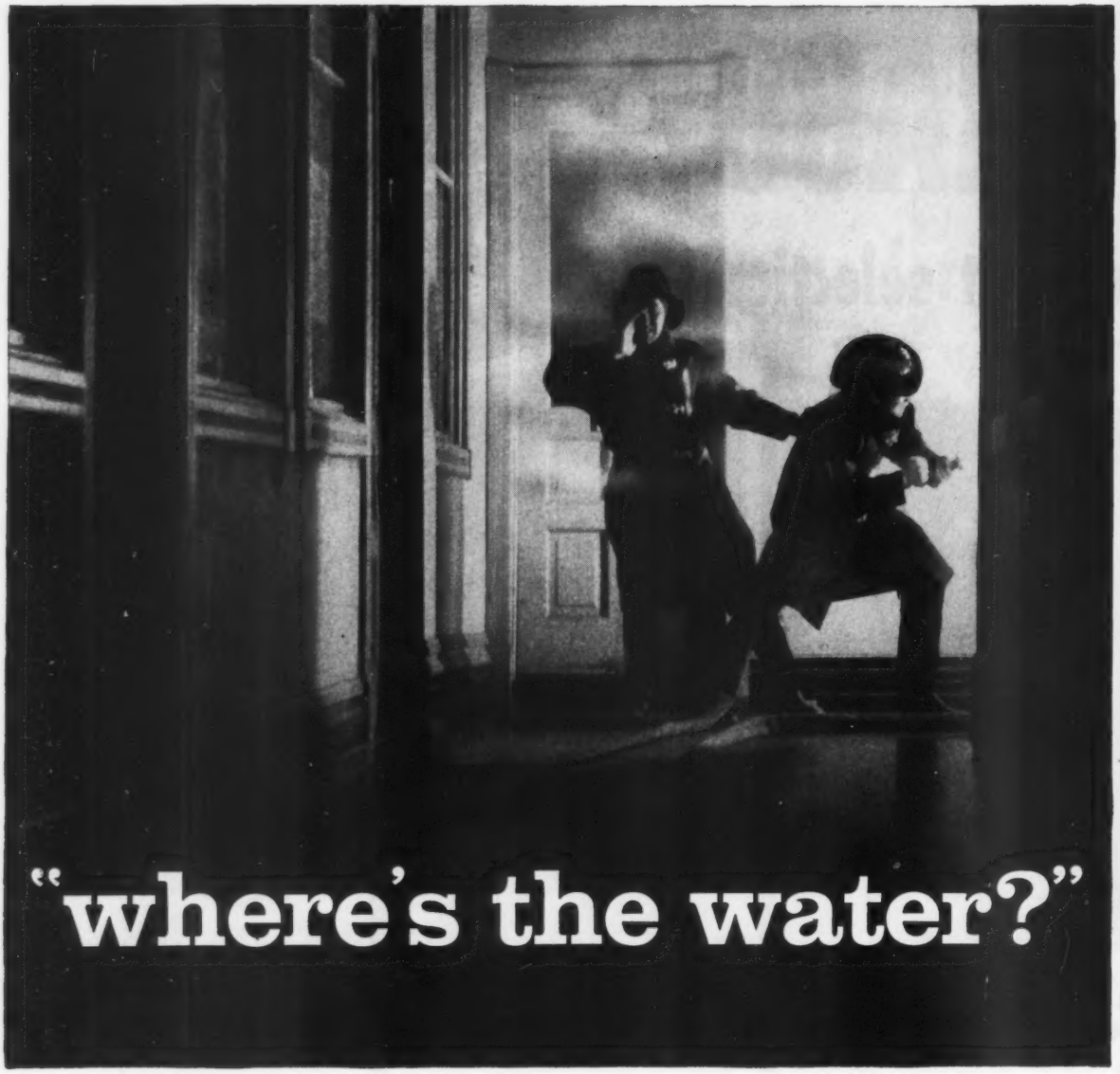
WOOSTER PERMANENT MOUNTED DELUGE GUNS

An economical volume gun for fire trucks, fire boats and industrial fire protection. Available in lever operated model as well as worm and gear operated style shown here. All bronze construction. Discharge pipe 2¾" ID. Maximum discharge 2000 GPM. O-ring construction with ball bearing races makes these pipes easy to turn at any pressure.

Many other nozzles also available — see your Wooster Brass Catalog!

WOOSTER BRASS DIVISION

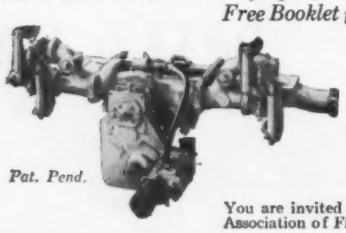
THE FYR-FYTER COMPANY • WOOSTER, OHIO



new Waterous *Electro-Matic pump gets water to the fire in less time

The *Electro-Matic* is the first fire pump to offer power operation for all major pump controls. You get into action faster, during those precious early minutes. You start pumping without lost motion. New Waterous *Electro-Matic* gives you push-button controls that reduce the chance of error and offer greater protection to personnel. Main pump is engaged at the flip of a switch; the powerful rotary-gear primer goes into action with the push of a button; "open" and "close" push-buttons unlock, reset and lock the discharge valves; a simple "volume-pressure" switch sets the transfer valve. And that's not all. The *Electro-Matic* is an entirely new pump in design. It weighs less, requires less space and can be mounted in a variety of methods to meet requirements of all modern chassis. All this plus the features that have made Waterous pumps famous such as horizontally-split, *two-piece* case and full ball-bearing construction.

Free Booklet gives complete details. Your copy by return mail. Send for it today.



Pat. Pend.

WATEROUS *Electro-Matic*

80 E. Fillmore Ave., St. Paul, Minn.
Dept. 303

*Registration applied for.

You are invited to inspect the new Electro-Matic pump at the 83rd Annual Conference, International Association of Fire Chiefs in Miami, Florida. See you at Booths 46 and 47, November 12 thru 16, 1956.

CARPENTER LIGHTS

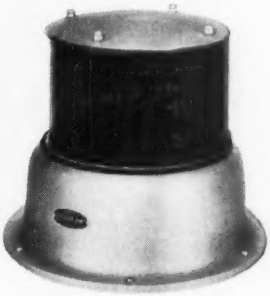
SPOTLIGHTING FOUR GOOD REASONS WHY EVERY FIRE DEPARTMENT NEEDS THEM

1 To clear the way!

Two of the many types of CARPENTER Warning Beacons are illustrated here. Above is the "WIG-WAG" REDHEAD . . . an oscillating beam sweeps the way. Six or eight inch diameter available.

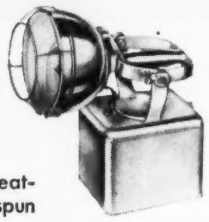
At left is the RAD FLASHING AUTOMOTIVE BEACON. Powerful, half-mile range in all directions from its 5⅛" Fresnel Beehive Dome in red, blue, amber, or combinations.

NEW! The RAR ROTATING AUTOMOTIVE BEACON is newly designed. High-intensity, sealed-beam spotlight rotates horizontally to project its powerful beam through a full 360°. Mounts snuggly on any roof contour or use as stationary beacon. Sturdy, sim-chrome aluminum construction.



Size A — 6, 12, or 115 volt, 11" x 10" high... $62.50
Size B — 6 or 12 volt, 7¼" x 6½" high..... $49.50

2 To see danger!



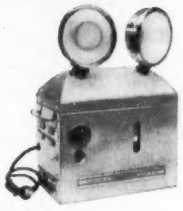
When the need is for a portable searchlight or work light, CARPENTER'S "PORTALITES" are highly recommended. Standard equipment in most fire departments, they are built for longer life, dependability, and rough treatment. Beautifully wire-brushed, cast or spun aluminum throughout. Illustrated model has self balancing handle and rechargeable battery, two-way switch giving choice of mile-range searchlight or 20 hour continuous work light. Many other rechargeable and dry cell battery types available. Send coupon for details.

3 To warn of danger!

Protect men, equipment, and the public from injury, with CARPENTER WARNING BEACONS. The RHD FLASHING HIGHWAY BEACON shown here will protect fire hose and has other emergency applications. Powerful beams are visible for a half mile in any direction. Fresnel Beehive Dome in Red, Blue, Amber, or combinations. 72 hours continuous light . . . much longer if used intermittently. Other models available, including Neon types for 100 days and nights per battery.

4 To protect property!

When your recommendation or advice is sought for automatic emergency lights in places of business, public assembly, or industrial plants, etc., remember "Watchmaster" AUTOMATALITES. Instant, automatic illumination for large areas or pinpointing of critical control sectors. The highest quality at the lowest practicable price. A complete line is available for all applications including explosion-proof, remote control, hospital lights, etc. Send coupon for literature.



CARPENTER Manufacturing Company

200 BRADLEY STREET
SOMERVILLE 45, MASS.

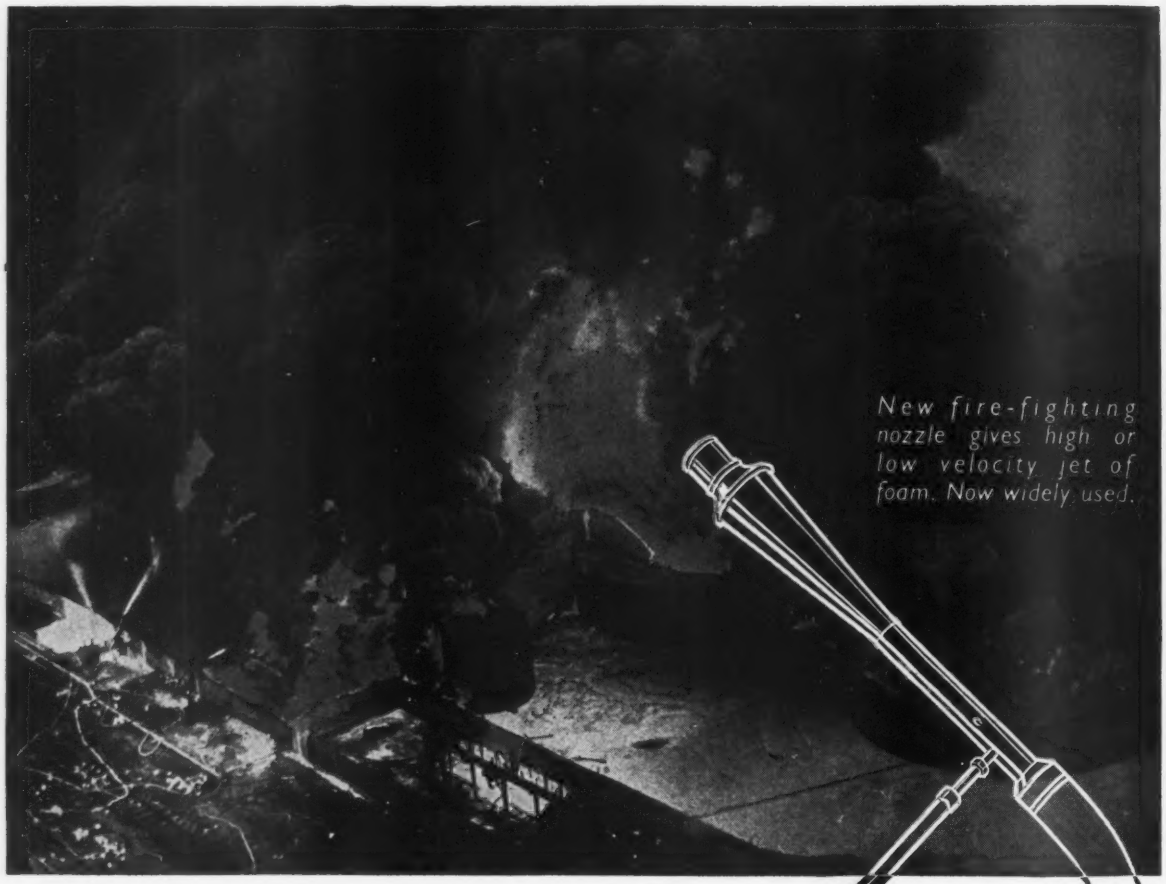
Mail coupon for details →

Send more information about _____

Name _____ Title _____

Address _____

IN CANADA — NORTHERN ELECTRIC CO.



New fire-fighting nozzle gives high or low velocity jet of foam. Now widely used.

This is the type of fire that is

KILLED FAST BY

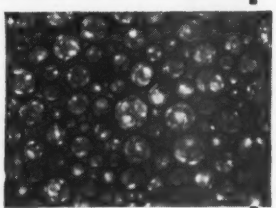
Nicerol

Foam Blanket— AND WILL STAY DEAD

A dense blanket of adhesive, cohesive foam which actually follows the fire, stifles it, outlasts it and prevents flash-back — that's Nicerol, most widely used foam compound in the world.

Nicerol, with pH 6.8 to 7.3, ensures freedom from corrosion in equipment and storage drums. It does not form sludge. 3 gallons of Nicerol NLXX (3%) Foam Liquid with 100 gallons of water, fresh or salt, forms 1,000 gallons of foam.

It can cost you nothing to test Nicerol this way. Write the one word SAMPLE on your official stationery and we will send you, freight pre-paid anywhere in the U.S.A. or Canada, a 5 gallon can of Nicerol NLXX (3%) for $20 C.O.D. (or please enclose draft). The $20 cost of this sample will be deducted from your first 100 gallon or larger order for Nicerol.



Phot micrograph X30, showing closely-knit bubble blanket of Nicerol foam, strongly cohesive, adhesive, outlasting the fire.

Full technical and commercial details available from:—

GEORGE REYNOLDS & ASSOCIATES, P.O. BOX 395, THORNWOOD, NEW YORK.
THE GENERAL DETROIT CORP., P.O. BOX 263, DETROIT 32, MICHIGAN.
THE GENERAL PACIFIC CORP., 8740 WEST WASHINGTON BLVD., CULVER CITY, CAL.

you can bet a fireman designed this pump!

From harness to shut-off nozzle, the Dragon Fire Pump is designed from the firefighter's point of view . . . has *everything* he wants in a back-pack pump. And it boosts his efficiency by cutting down fatigue.

The special Dragon harness is easy to get into and designed so the pump rides high on the fireman's back where it can't throw him off balance or interfere with walking or climbing. Just a few easy strokes of the pump lever gives the operator a *continuous* flow of water he can direct right where it does the most good. And a mere twist of the shut-off nozzle gives either solid stream or spray *instantly.*

Here's another advantage the firefighter appreciates! When he's using a Dragon Fire Pump, he can take his hands off both shut-off nozzle and pump lever to use rake, shovel, or other tool.

A Dragon Fire Pump comes *completely assembled* and requires little maintenance. There is no pump packing to dry out: even after standing idle for long periods, the pump is ready for instant use.

PARCO PRODUCTS COMPANY

PENNSBURG, PENNSYLVANIA

Dragon **FIRE PUMPS**

now available in 2 models

No. 150-S—Stainless Steel Tank

No. 150-G — Galvanized Tank: Cold-rolled steel, hot-dipped galvanized after fabrication.

All units equipped with brass pumps; all tanks seam welded. Capacity 5 gallons

DRAGON FIRE PUMPS meet Underwriters' Laboratories requirements and can be supplied with the UL label of inspection attached.

VALUABLE DISTRIBUTORSHIPS AVAILABLE, WRITE TODAY.

NEW INTERNATIONAL V-8's

Most powerful you can get!

To GO when you get the call . . . you can really *move* with the new INTERNATIONAL V-8-powered fire trucks. They have the most powerful V-8's under any fire truck hood—226 or 257 hp.

You get needed responsive power for every traffic condition—hills, corners and straightaways. New V-8 power is designed for fast starts and high rate of acceleration, less shifting and high road speeds.

In addition to the top performance you would expect, these new fire trucks are built to last. They incorporate the traditional INTERNATIONAL quality, plus many new and exclusive long-lasting features.

Detailed information is yours for the asking. Call or stop in at any INTERNATIONAL Dealer or Branch.

INTERNATIONAL HARVESTER COMPANY • CHICAGO

INTERNATIONAL® TRUCKS

All-Truck Built to save you the BIG money!

Motor Trucks • Crawler Tractors • Construction Equipment
McCormick® Farm Equipment and Farmall® Tractors

FOR FIREFIGHTING OR BOOSTER SERVICE the highly portable, light-weight Marlow Fire Pump can be quickly moved to a fire or water source that a pumper can't reach. For fire-fighting, the unit boosts hydrant pressure or pumps from any pond, or shallow well. Small departments can dispatch it to dreaded second fires. For booster service the pump can be carried by two men to inaccessible water sources. The pump pushes water up hills or over long distances to supply pumpers or tank trucks.

marlows are portable

The Marlow Fire Pump, weighing only 160 pounds ready to operate, *can be placed in service 30 seconds after starting!* Powered with an 8½ hp. engine, the unit runs unattended and delivers up to 100 g.p.m. at 80 p.s.i. It can be stored in pumper compartments or car trunks. Meets recommendations of National Fire Protection Association and performance exceeds minimum requirements. For details, see your Marlow dealer or write for Bulletin F-04.

MARLOW PUMPS • RIDGEWOOD, NEW JERSEY

DIVISION OF BELL & GOSSETT COMPANY • *Branch Factories: Longview, Texas • Morton Grove, Illinois*

In 1908—the CHICAGO FIRE DEPT. — then as now — was up-to-the-minute with Waukesha Engine powered equipment.

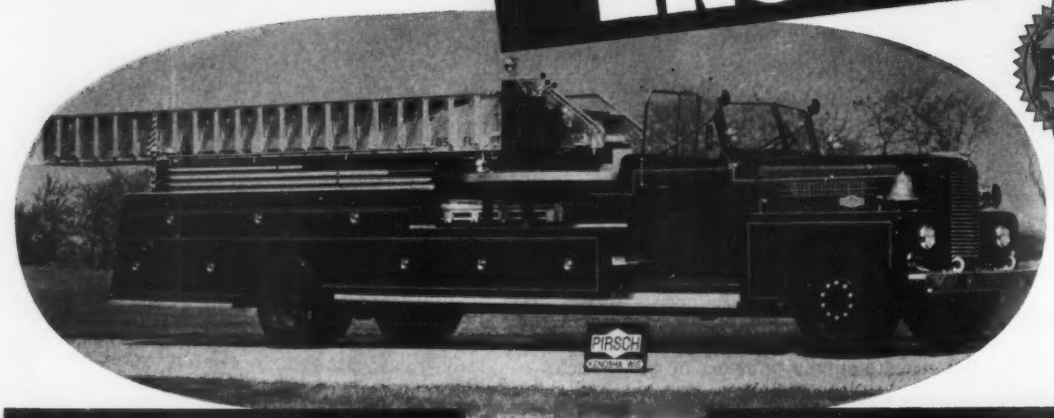
first in FIRE FIGHTING

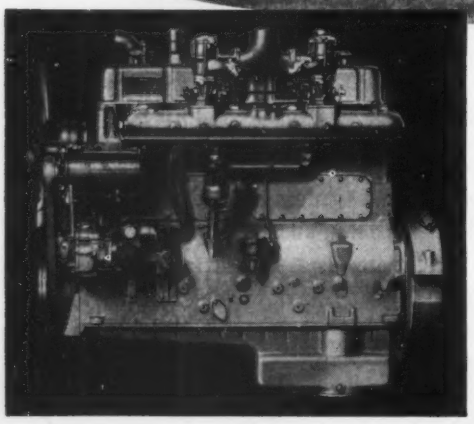
for almost fifty years

...Waukesha Engines—*first* in fire fighting—the preferred power for the finest equipment, because specially built for *faster* fire fighting, they are reliable all the way. *Waukesha Motor Company, Waukesha, Wisconsin, New York, Tulsa, Los Angeles.*

WAUKESHA FIRE FIGHTER ENGINES

50th ANNIVERSARY Waukesha MOTOR CO. 1906-1956





WAUKESHA FIRE FIGHTER ENGINES

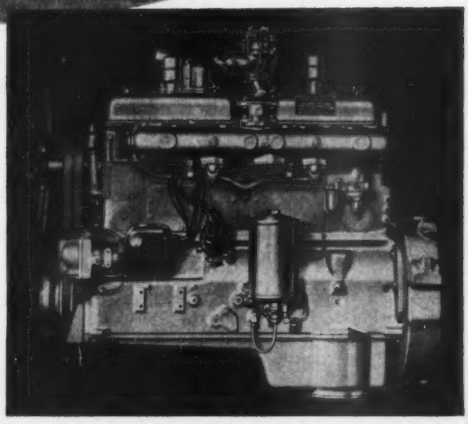
Counterbalanced or Non-Counterbalanced

Typical 145 Series 779 or 817 cu. in., up to 275 hp.

Typical 140 Series 525 or 554 cu. in., up to 226 hp.

Send for Bulletins

321



SQUEEZES PAST OBSTRUCTIONS

E & J RESUSCITATOR - INHALATOR - ASPIRATOR

E & J RESUSCITATOR • ASPIRATOR • INHALATOR
. . . first name in Resuscitators

When partial obstructions will not yield to aspiration, or when the air passages are swollen almost shut, the exclusive E & J feature "Precision Flow Control" assumes life-saving importance in emergency rescue treatment.
With it the operator can quickly find just the exact flow of oxygen that will squeeze past obstructions short of complete blockage to provide full inhalation and exhalation at a *slow but life-saving rate!*

FIND OUT MORE ABOUT
THIS VITAL E & J FEATURE . . .
Data and demonstration without obligation.
Write to Dept. 544-7 at address below.

E & J MANUFACTURING COMPANY

100 E. Graham Place, Burbank, California

"OH, THAT'S JOE. HE'S USING HEWITT-ROBINS 'DACRON†' FILLER, THE LIGHTWEIGHT, EASY HANDLING HOSE!"

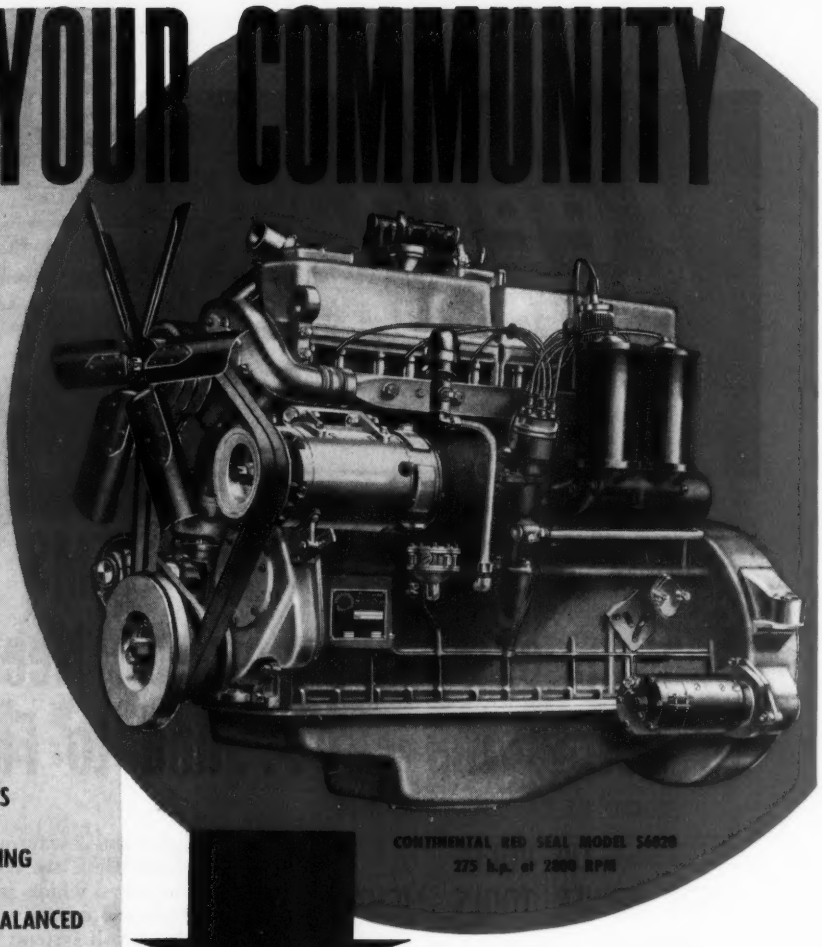
Hewitt-Robins manufactures all types of Municipal and Industrial Fire Hose.

†Du Pont T. M.

HR **HEWITT-ROBINS** • STAMFORD, CONNECTICUT

Hewitt Rubber Division, 240 Kensington Avenue, Buffalo 5, New York

DEFEND YOUR COMMUNITY



ONLY IN CONTINENTAL RED SEAL WILL YOU FIND ALL THIS:

- FULL-LENGTH WATER JACKETS
- PATENTED INDIVIDUAL PORTING
- TOCCO-HARDENED COUNTERBALANCED CRANKSHAFT
- ALLOY STEEL VALVE SEAT INSERTS
- LEAKPROOF WATER PUMP
- PATENTED OIL AND DUST SEALS
- POSITIVE ROTATION EXHAUST VALVES

1955 WINNER NATIONAL SAFETY COUNCIL PUBLIC INTEREST Award

—with Equipment Using CONTINENTAL POWER EXCLUSIVELY

Fire apparatus is subjected to the sort of usage which underscores the need for extra care in its choice. Here, as in any field where round-the-clock reliability is a must, it's wise to standardize on a leading make—a make that features Continental Red Seal power. Red Seals are the product of more than a half-century of specialized experience. Every model is engineered expressly for its work . . . and backed by service and genuine Red Seal parts throughout the globe.

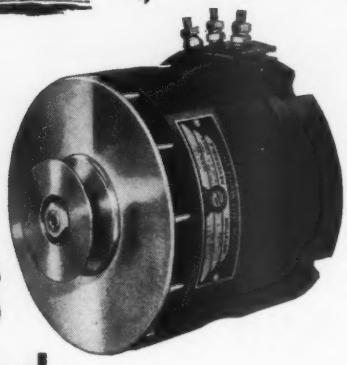
MORE POWER TO YOU FOR THE TOUGH JOBS
EVER SINCE NINETEEN HUNDRED TWO

CONTINENTAL MOTORS · Powerful as the Nation · AMERICA'S STANDARD ®

Continental Motors Corporation
MUSKEGON • MICHIGAN

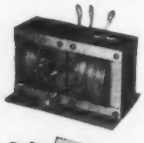
6 EAST 45TH STREET, NEW YORK 17, NEW YORK • 6218 CEDAR SPRINGS ROAD, DALLAS 9, TEXAS • 3817 SOUTH SANTA FE AVENUE, LOS ANGELES 58, CALIFORNIA • 1252 OAKLEIGH DRIVE, EAST POINT (ATLANTA) GEORGIA

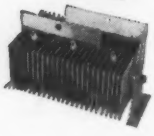
Leece-Neville



AC-DC ALTERNATOR SYSTEMS Guarantee the Current You Need to Get to the Fire... and to Fight the Fire

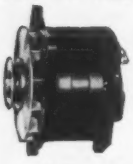
110 VOLTS FOR POWER TOOLS, LIGHTS





Installation of a Leece-Neville Transformer and 110 volt Rectifier with your L-N Alternator will provide up to 1200 watts of 110 volt d.c. current for spot and flood lights, half-inch drill, power saw etc. Send for special bulletin.

A GENUINE L-N ALTERNATOR AT A SENSATIONAL LOW PRICE



For loads up to 60 amps at 6 volts or 50 amps at 12 volts, see the new L-N Standard Alternator System that costs *less* than "extra" output d.c. generator.

Sirens, lights and 2-way radio make a heavy electrical load that can drain the battery. Leece-Neville Heavy-Duty Alternators, which replace conventional d.c. generators, have the capacity to carry the load: up to 95 amperes for 6 volt systems; to 180 amperes for 12 volt; to 100 amperes for 24 volt.

At the fire, L-N Alternators produce up to 40 amperes with the engine idling, keep batteries "up" and permit use of 2-way radio.

THE ORIGINAL AC-DC GENERATING SYSTEM—RECOGNIZED EVERYWHERE

Since 1946 more and more Fire Departments have made L-N Alternators standard. Some of these are Atlanta, Boston, Buffalo, Chicago, Cleveland, Dallas, Denver, Detroit, Los Angeles, Miami, Montreal, New York, Pittsburgh, Toronto, and many others, large and small.

Be sure to specify Leece-Neville on new apparatus and in your modernization program. For all the facts, and name of your L-N Distributor, write The Leece-Neville Company, Cleveland 3, Ohio. *Distributors in principal cities . . . Service Stations everywhere.*

YOU CAN RELY ON Leece-Neville

Automotive Electric Equipment Since 1909

TRUCK • BUS • DIESEL • INDUSTRIAL • PASSENGER • RAILROAD • MARINE • OFF-HIGHWAY

ALTERNATOR SYSTEMS

D C GENERATORS

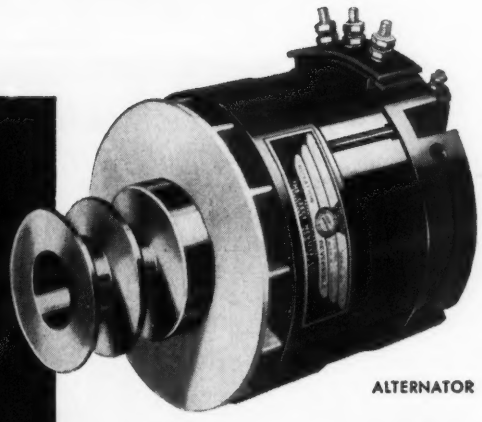
CRANKING MOTORS

REGULATORS

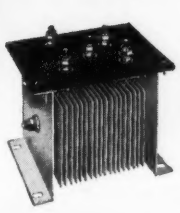
SWITCHES

SMALL MOTORS

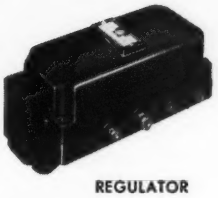
Leece-Neville



ALTERNATOR



RECTIFIER



REGULATOR

New AC-DC ALTERNATOR SYSTEM DELIVERS *125* Amps

Weighs only 44 lbs.
Costs much less than comparable d.c. system

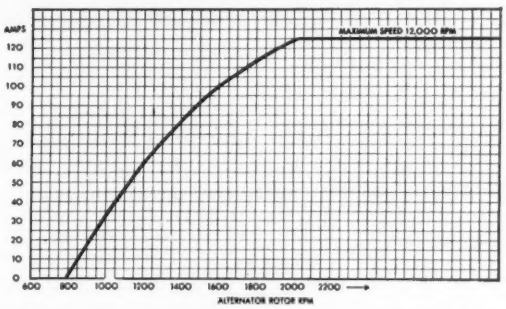
At the price you formerly paid for a 100 ampere L-N Alternator System, you now get 125 amperes . . . and at a cost far below that of a d.c. generator.

Built on a 6⅝ inch diameter frame, the Alternator weighs only 27 lbs. Rectifier and Regulator bring the total weight of the generating system to only 44 lbs. Compare that with the weight of a d.c. generator of the same output and you'll find an important weight saving.

The performance curve shows the low cut-in speed and rapid attainment of full output. Charging current at engine idle speed will vary with drive ratio.

This new L-N Alternator System is ideally suited for many types of vehicles with 12 volt electrical systems: buses, trucks, trolley coaches, school buses, fire trucks, mine and construction equipment. For applications requiring a fan-cooled rectifier, an Alternator with a shaft-mounted fan at rear is available.

PERFORMANCE AT 12 VOLTS



There are L-N Alternators with capacities ranging to 95 amperes for 6 volt systems; to 180 amperes for 12-volt; to 100 amperes for 24 volt; and to 50 amperes for 32 volt. All of them have the rugged design and precision manufacture that give L-N Alternators unmatched reliability and long life. Be sure to specify Leece-Neville.

Since 1946, L-N Alternators have been helping fleet owners cut operating and maintenance costs. For all the facts, write The Leece-Neville Company, Cleveland 3, Ohio. *Distributors in principal cities . . . service stations everywhere.*

YOU CAN RELY ON Leece-Neville

Automotive Electric Equipment Since 1909

TRUCK • BUS • DIESEL • INDUSTRIAL • PASSENGER • RAILROAD • MARINE • OFF-HIGHWAY

ALTERNATOR SYSTEMS

D C GENERATORS

CRANKING MOTORS

REGULATORS

SWITCHES

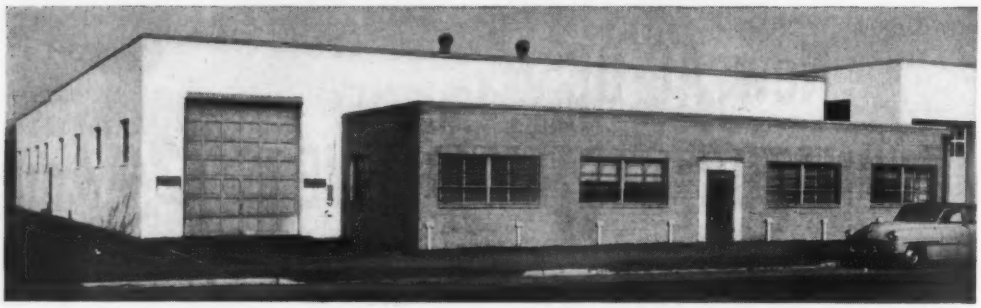
SMALL MOTORS

PHILAMON LABORATORIES, INC.

Westbury, L. I., New York

protects its property *Automatically . . .* gets better FIRE and BURGLARY PROTECTION and

SAVES MONEY



The precise and exacting nature of the engineering and manufacture of Philamon's tuning fork frequency standards demands extraordinary safeguards against conditions which might affect our operations. After a full year's experience with ADT, we are convinced that our new 15,000-square-foot plant enjoys maximum protection at minimum expense.

Boris F. Grib President

Philamon Laboratories, Inc., manufacturers of electronic components, is typical of the hundreds of smaller industrial plants protected **automatically** by ADT. A combination of Central Station Burglar Alarm, and Sprinkler Supervisory and Waterflow Alarm, protects property, profits, and employees' jobs **at a lower cost than other less effective methods.**

Whether your premises are new or old, sprinklered or unsprinklered, there is an appropriate ADT Fire Alarm Service to detect fire and notify the fire department **automatically.** ADT Burglar Alarm Service will **automatically** summon police when burglars attack. ADT Heating and Industrial Process Supervision will **automatically** detect and report other abnormal conditions.

May we show you what ADT can do for you?

An ADT specialist will show you how combinations of automatic services can safeguard your property. Call our local sales office, or write to our Executive Offices.

Controlled Companies of

AMERICAN DISTRICT TELEGRAPH COMPANY

A NATIONWIDE ORGANIZATION

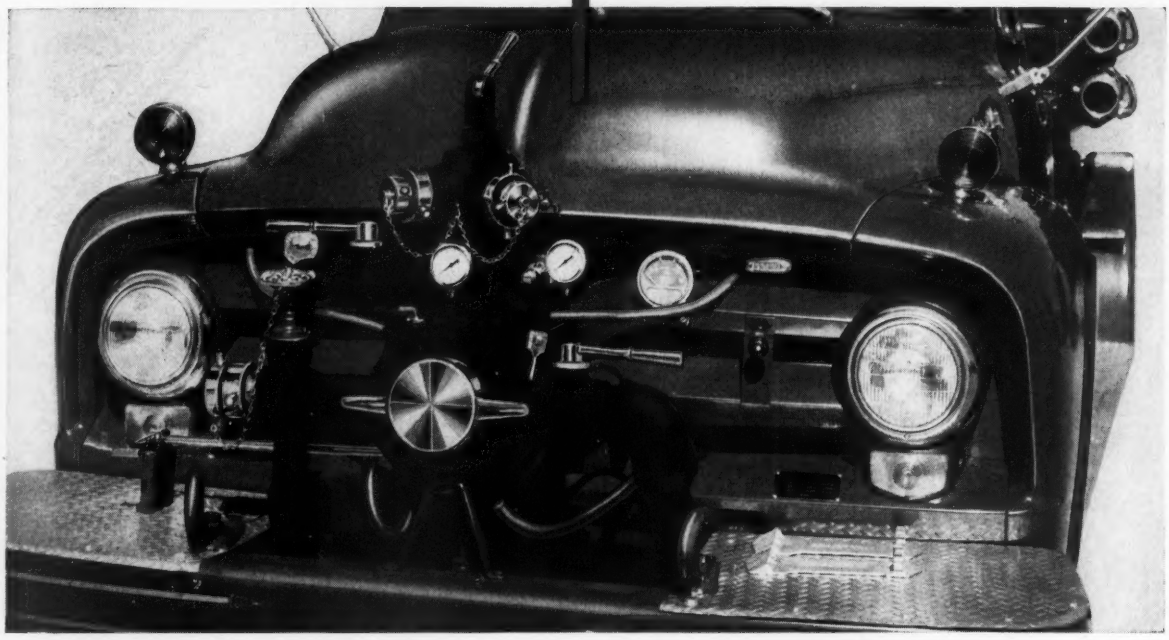
Executive Offices: 155 Sixth Avenue • New York 13, New York

ADT

AT THE I.A.F.C. CONFERENCE—
VISIT BOOTH 49—SEE THE

BARTON-AMERICAN
Front-Mounted Pump

easier to operate—simplest to install—and superior mechanically!



DELIVERED COMPLETE WITH PTO—READY TO MOUNT—

Save time and trouble! When you order a Barton-American Type UA Front-mounted Pump, just list the make and model of your truck. Your pump will be delivered *complete* with *factory engineered* PTO (power take-off) shaft, universal joints and pump gear ratios best suited to *your* truck's engine.

When you consider *any* front pump *without* complete PTO equipment, you can't be sure the mechanic who mounts it will properly solve the technical problems of torque load, angularity and crankshaft pulley design and installation.

With the UA, however, *you take no chances* on makeshift PTO design or engine overheating caused by improper installation. Even the newest trucks with low fan mountings will be properly fitted.

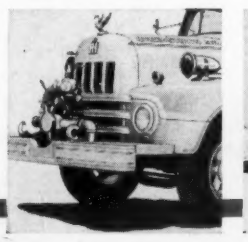
And simpler installation with factory-engineered drive is just part of the story. The UA Pump also gives you many other superior features—for peak performance and low maintenance.

Write Today for Bulletin 8330-B—and ask about our exclusive Service Pump Plan.

THESE UA PUMP FEATURES ARE WORTH HAVING!

- *Exclusive*, positive interlocking pump clutch that can't slip at a fire.
- Both volume and high-pressure to 400 pounds for effective fog streams.
- Fights fire while truck is moving.
- Fast, reliable, engine vacuum primer.
- Better weight distribution on chassis.
- Effective frost-proof construction.
- Less pump weight—you can carry more water or extra equipment.
- Pump gear ratio suited to *your* engine.
- Convenient controls, top-quality pump materials and precision construction.
- Both simplicity and front location of pump make maintenance fast and easy—a great help to volunteer departments.

P.T.O. DRIVE IS ENGINEERED TO SUIT YOUR TRUCK —ANY MAKE OR MODEL CHASSIS.



AMERICAN-MARSH PUMPS

BATTLE CREEK MICHIGAN

In Canada:
American-Marsh Pumps (Canada) Ltd., Stratford, Ont.

GM GENERAL MOTORS

GENERAL MOTORS LEADS THE WAY—

You get the dependable electric power necessary

for fire-fighting vehicles with Delco-Remy special electrical equipment

Instant, ample, *dependable* electric power is a must for fire-fighting vehicles.

Delco-Remy 6- and 12-volt A.C.-D.C. charging systems are the answer to the *extra heavy* demands of two-way radio, floodlights and the other special electrical units found on modern fire-fighting vehicles. Performance features include: unexcelled generator outputs at engine-idle, plus maximum outputs up to 180 amperes at higher engine speeds. These higher outputs not only supply ample current for a fire fighter's regular needs but also are available to pick up discharged batteries quickly in emergencies.

Where electrical loads are heavy but not excessive, Delco-Remy *extra-output* D.C. generators with matching regulators are right for the job.

Whichever type of Delco-Remy special electrical equipment you require, dependability under the most severe pumping conditions is assured.

Whenever you modernize older vehicles or order new ones, be sure to specify Delco-Remy electrical equipment, including the new longer life Delco batteries. You can get complete details through your General Motors car or truck dealer, or the United Motors System.

DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

STARTING WITH **Delco-Remy** ELECTRICAL SYSTEMS

OREN

750 TO 1,500 G.P.M

ALL NEW

CUSTOM-BUILT
TRIPLE COMBINATION
FIRE APPARATUS

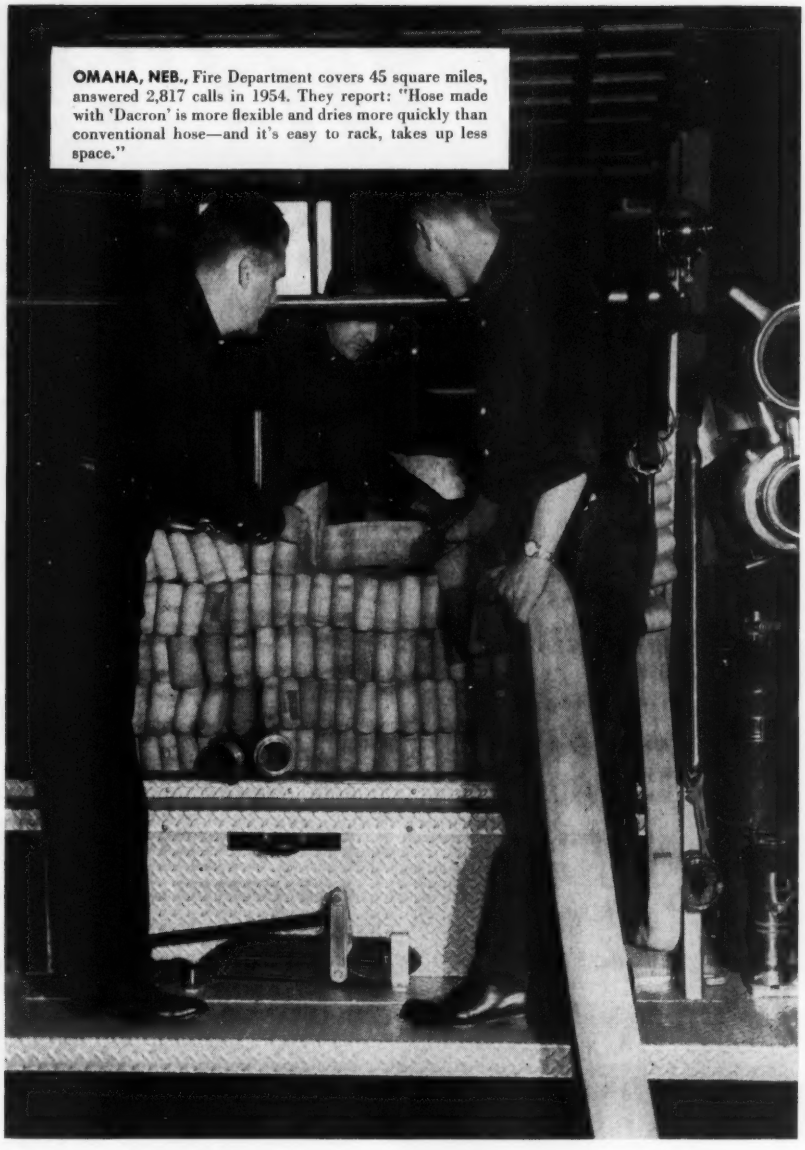
MULTI-SERVICE CENTRIFUGAL PUMPS
●
HIGH-OUTPUT OVERHEAD VALVE ENGINES

USING **HALE PUMPS**
. . . EXCLUSIVELY

SCHENECTADY, N. Y.—Hose made with "Dacron" is preferred because it gets into action fast . . . gives better all-around performance.

BIRMINGHAM, ALA.—Lightweight, extra-strong hose made with "Dacron" is used because it's easy to handle, easy to carry.

AUGUSTA, GA.—Hose made with "Dacron" is used because it racks and coils in less space. (Hose made with "Dacron" is at left.)



OMAHA, NEB., Fire Department covers 45 square miles, answered 2,817 calls in 1954. They report: "Hose made with 'Dacron' is more flexible and dries more quickly than conventional hose—and it's easy to rack, takes up less space."

Omaha Fire Dept. reports:

"Hose made with DACRON dries quickly, is easy to rack"

REG. U. S. PAT. OFF.

The Omaha Fire Department uses 10,000 feet of hose made with "Dacron"* polyester fiber. Chief Eugene W. Fields reports it gives better all-around performance. Used as the load-carrying "filler" cord that reinforces the hose, this Du Pont fiber makes possible a hose that's light and flexible—yet *stronger* than ordinary hose of the same construction.

Du Pont makes "Dacron" and supplies the yarn to hose manufacturers. The combination of the unusual properties of "Dacron" plus hose manufacturers' skill has resulted in a superior fire hose. Hose made with "Dacron" is made by all leading fire-hose manufacturers. The next time *you* need hose, be sure it's made with "Dacron". E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

ADVANTAGES OF FIRE HOSE MADE WITH "DACRON":

- Lighter
- Stronger
- Dries faster
- More flexible
- Cuts loading time
- Saves space

*"*Dacron" is Du Pont's registered trademark for its polyester fiber*

For Better All-Around Performance Specify Hose Made with "Dacron"

POLYESTER FIBER

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

1059 ITEMS from a SINGLE SOURCE!

Fyr-Fyter offers you the most complete line of quality fire extinguishers and fire department equipment in the industry!

Fyr-Fyter is the largest single source for Underwriters' approved portable fire extinguishers, fire hose, nozzles, couplings and other brass goods, pumps, clothing, ladders, warning and signaling devices, first aid kits, masks and breathing apparatus! Select from a practically limitless list of extinguishers and equipment that meet all the needs of *municipal, industrial* and *commercial fire departments.*

All of these products are available through Fyr-Fyter sales and service representatives . . . the largest sales force in the industry! They are fire protection specialists with knowledge, experience and training to offer counsel and make recommendations on specific problems. They represent a company that has enjoyed a nationally respected reputation for quality products since 1916.

YOU TALK TO ONE SALESMAN . . .
PLACE ONE ORDER . . . PAY ONE BILL!

TEAR OUT THIS COUPON AND MAIL WITH YOUR LETTERHEAD TODAY!

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OUR 40th YEAR OF MANUFACTURING . . . THE MOST COMPLETE LINE IN INDUSTRY

BRANCH OFFICES: NEW YORK, BOSTON, PHILADELPHIA, CHICAGO, ATLANTA, DALLAS, SAN FRANCISCO, PORTLAND, SEATTLE

"First Major Advancement in Resuscitators in 20 years"

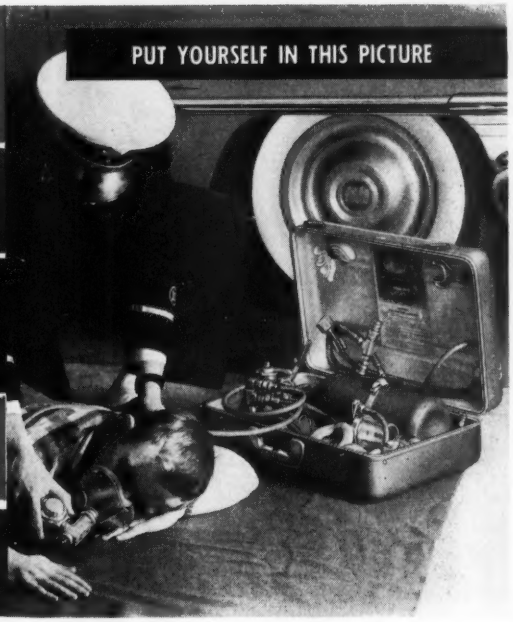
Originally developed for the U.S. Air Force . .
Winner of the Thurman H. Bane award

Greatest safety for patient . . .

Operates with positive and negative pressure, or positive pressure alone

Selective air dilution Extends Operating Time

30 lbs. light . . . easily portable . . .



modern

THE GLOBE SEELER UNIVERSAL RESUSCITATOR

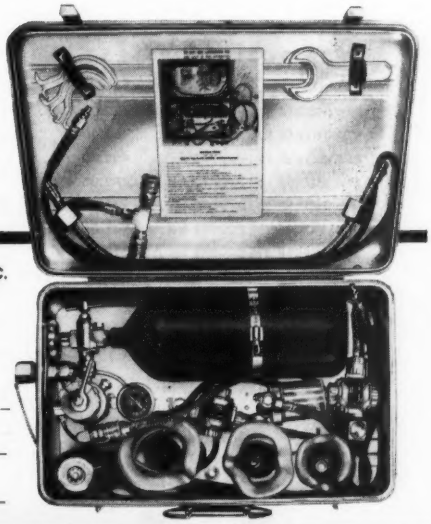
out-performs all other resuscitators made!

Safest . . . multiple safety valves protect patients.

Versatile . . . permits positive and negative pressure or intermittent positive pressure. Fully and easily adjustable to meet infant or adult requirements.

Efficient . . . easy to carry and use. Up to 60% air dilution triples operating time.

Effective . . . Inhalator, Aspirator, Resuscitator.



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See this resuscitator at the Fyr-Fyter exhibit at the International Association of Fire Chiefs

GLOBE

NEW
SEA-HORSE
5½

Ready to go, *now*—emergency truck of the Davenport, Iowa Police Department

DEPENDable

9 MODELS FOR 1956

*JAVELIN	30 hp	$582.00
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SEA-HORSE 15	15 hp	362.00
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**Electric Starting... Prices f.o.b. factory, subject to change... OBC certified brake hp at 4000 rpm (30's at 4500 rpm).*

No delays or excuses tolerated here! That's why police and fire departments everywhere specify DEPENDable Johnson Sea-Horses.

Now, for 1956, there are nine Sea-Horses. A size for every need. And, there are great new features that are blessings in emergency work, time and again. Easier, smoother starting for example. Stall-Proof Idling—which prevents accidental stalling of motor when shifting and maneuvering. Cruising Range Fuel Saver—which saves one gallon of gas out of every five. And more!

See your Johnson Dealer. He will gladly help you select the right power for your needs. Look for his name under "Outboard Motors" in your classified phone book.

FREE. Catalog describing all nine 1956 Johnson Sea-Horses. Complete. Factual. Helpful. Send for your copy now.

JOHNSON MOTORS, 7000 Pershing Road, Waukegan, Illinois
A DIVISION OF OUTBOARD, MARINE & MANUFACTURING COMPANY
In Canada: Manufactured by Johnson Motors, Peterborough

Johnson SEA-HORSE OUTBOARD MOTORS

ALL JOHNSON SEA-HORSES ARE PROTECTED AGAINST SALT WATER CORROSION—NO FLUSHING NECESSARY

Natecs gives SAFE clearance of intersections . . .

even protects against collisions of two emergency vehicles

In the NATECS system, a receiver mounted on the traffic signal at the intersection picks up a beam from a transmitter mounted on the approaching vehicle. Traffic lights automatically set on the emergency pattern. Then a *white* light turns on, *assuring* the emergency-vehicle driver that the intersection is clear.

If *two* signals are received at an intersection from emergency vehicles approaching from different directions, the white light facing the *second* vehicle flashes on and off, warning that another vehicle has priority.

Operation on radar frequencies permits a *narrow* beam that won't affect any signals but those directly ahead (up to ¼ mile) of the emergency vehicle. Completely automatic. No need to flip a switch as the vehicle changes direction. And after the vehicle passes the intersection, traffic lights automatically revert to normal sequence.

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Eagle equipment saves lives . . . saves time

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Please send complete information on Eagle's new emergency traffic control system.

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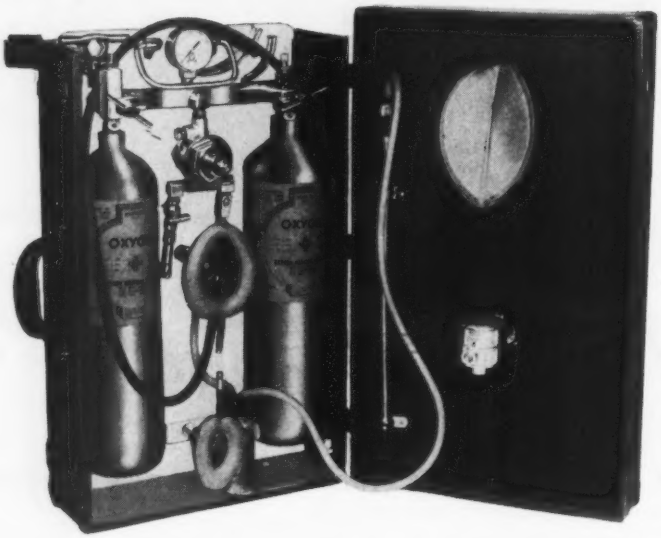
REVIV-A-LIFE

RESUSCITATOR — ASPIRATOR — INHALATOR

equipped with BAER MODEL CONTROL VALVES

- ***Safe and dependable—yet simple, self contained, light weight, for ease of operation.***
- ***The new Venturi Action eliminates spring and toggle mechanism and reduces service requirements.***



Easy to Carry—

Mounted on a removable aluminum panel, Reviv-A-Life weighs only 35 lbs. including two "D" tanks (45 lbs. in carrying case) —can be carried by one hand.

Superior Features and Quality at Moderate Cost

The Reviv-A-Life Resuscitator is an automatic breathing machine which will rhythmically inflate and deflate human lungs with safety.

All oxygen controls to regulate resuscitation or inhalation are in the control valve which may be held in the hand. This feature enables one operator to service the patient at any distance from the supply tanks—important when the resuscitator must be used in limited space.

No complicated adjustments to confuse the operator.

Instant change from resuscitation to inhalation and back–aspiration immediately available with a simple twist of T cock.

• Attractively Priced **• Satisfaction Guaranteed**

Sold through dealers and equipment manufacturers. Write for literature, prices and name of nearest dealer. No obligation.

Manufactured by

MIDWEST OXYGEN EQUIPMENT CO.

Exclusive licensee under patents pending

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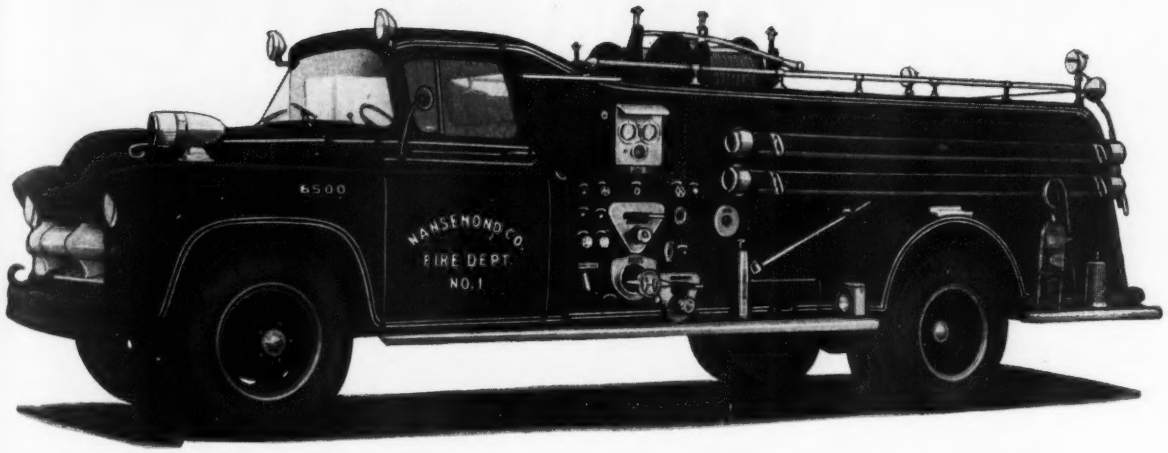
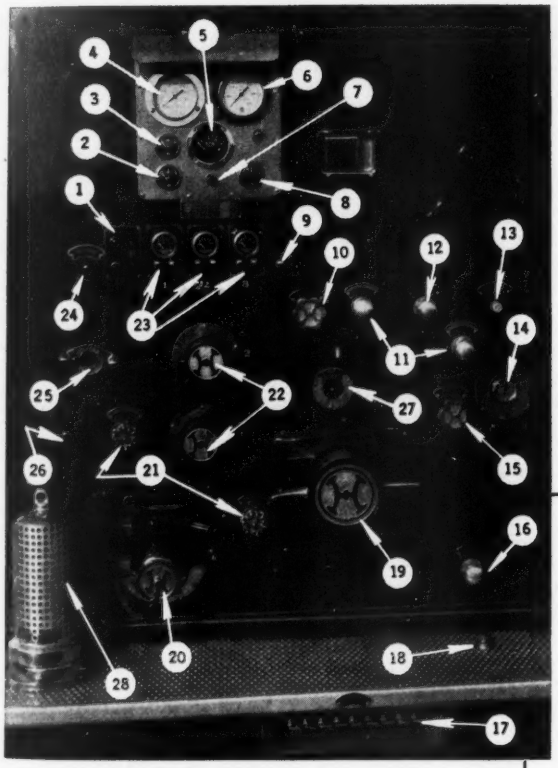
REPAIRS ACCESSORIES REFILLS TANK TESTING



Another First in Fire-Fighting Power

from HOWE

Incorporating, as always, the latest improved equipment, HOWE built the FIRST pumper featuring the Waterous Electro-Matic fire pump, the only fully power controlled fire pump. The new Waterous Electro-Matic pump features electrical shifting, push button priming and electrically operated transfer valves—also electrically operated 2½" discharge valves optional. Special design impellers and scientifically contoured waterways produce more volume in less space. The complete pump may be removed from top or bottom for servicing, or internal parts may be serviced from underneath. Gears are helical, constant mesh type. Here is added perfection of operation in HOWE Pumpers. Before you buy . . . contact HOWE.



FULLY POWER-CONTROLLED—Close-up of pump operator's panel shows arrangement of the push-button controls for fast, efficient operation. All controls are identified and panel is well-lighted for night operation.

IDENTIFICATION OF ITEMS

1—Electro-Matic transfer valve control
2—Oil pressure gauge
3—Water temperature gauge
4—Compound gauge—Vacuum and pressure
5—Tachometer—Engine speed indicator
6—Pressure gauge
7—Starter switch
8—Ammeter
9—Push button primer control
10—Tank fill valve control
11—1½" outlet controls
12—Reel valve control
13—Hand pump speed counter outlet
14—Tank level gauge
15—Engine cooler control
16—Tank suction valve control
17—Pump drains
18—Primer oiler tank filler
19—Large suction inlet
20—2½" gated suction inlet valve
21—Hose drains
22—2½" gated discharge valve
23—Electro-Matic discharge valve controls
24—Automatic Vacuum Clutch control
25—Pressure relief control
26—Throttle control
27—Automatic pump prime indicator
28—4½" Quick release holder for suction fittings

HOWE

Member FAM (Fire Apparatus Manufacturers Association)

HOWE

"dependable fire apparatus since 1872"

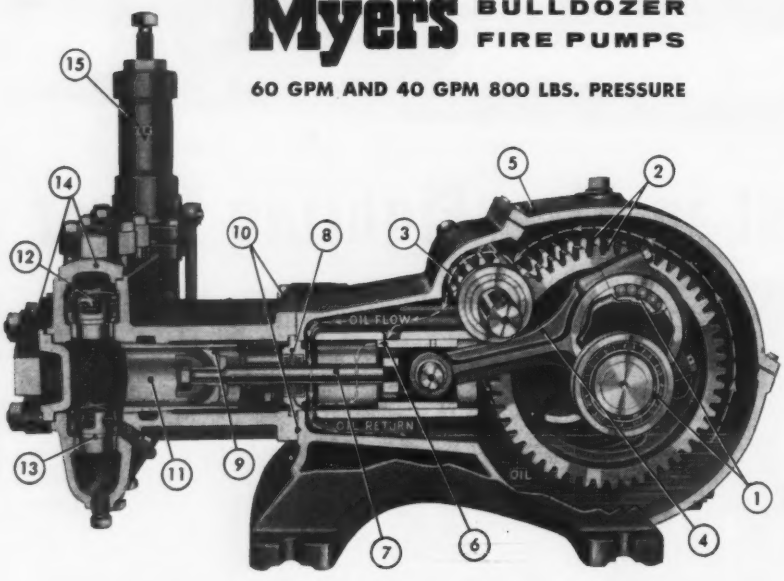
FIRE APPARATUS COMPANY

Dept. FE-10, 1400 W. 22nd St., Anderson, Indiana, U.S.A.

Built by Myers for PRESSURE!

Myers BULLDOZER FIRE PUMPS

60 GPM AND 40 GPM 800 LBS. PRESSURE



See Numbered Cutaway Drawing

Manufacturers of fire-fighting equipment—and fire chiefs alike—specify Myers Giant Bulldozer fire pumps to deliver the dependable pressure required for vital high-velocity stream or cooling fog. Built by Myers and backed by nearly 80 years of pump engineering know-how, the Giant Bulldozer is designed to withstand the severe strain and hard service required of pumps operated under high pressures. Check these quality features one by one:

1. ROLLER BEARINGS—Throughout with hardened-steel wearing surfaces.

2. LARGE DOUBLE MAIN GEARS—Eliminate side thrust, strains, stresses and breakage. Friction, wear and loss of power are reduced to a minimum. Quiet, smooth, efficient and economical operation.

3. PINIONS—Flame-hardened steel, cut integral with the Shaft—no keys to wear or loosen.

4. CONNECTING LINKS—Extra long, move directly in line with the cylinders. Have oversize wrist pins with removable bronze bushings. Large roller bearings reduce friction and power loss to a minimum.

5. GEAR CASE—Dust, dirt and drip proof. Working parts removable without draining oil.

6. CROSSHEADS—Large diameter and extra long. Keep plungers centered in cylinders—cups wear evenly, last longer.

7. PISTON RODS—Stainless steel, accurately centered and securely fastened into crossheads.

8. WATER AND OIL SEALS—To prevent water from entering and oil from leaving gear or oil chamber.

9. PLUNGERS—Rubber and fabric cups—easily replaced at low cost.

10. WATER END—Flanged and bolted to gear case—no long bolts to stretch and loosen.

11. CYLINDERS—Heavy-steel shell with smooth, wear-resisting, non-corroding, porcelain lining. Patented. Tapered fit—no packing required. Easily removed and replaced.

12. FLAT VALVES—Patented. Spring loaded, disc type. Stainless steel disc, seat and spring. Fast and positive seating.

13. VALVE SEATS—Hardened stainless steel, tapered, no gaskets—less corrosion, less wear, more efficient.

14. VALVE AND CYLINDER CAPS—Have recessed gaskets and are held by bolted clamps. Can be quickly and easily removed.

15. PRESSURE REGULATOR—Diaphragm type. Fast, positive Flat Disc Valve.

CRANKSHAFT—Forged Steel Precision machined for extremely accurate tolerances. Heat treated and carefully balanced.

FREE

For complete details write for a free catalog section covering the full line of Myers fire pumps, high-pressure guns and fog nozzles. Send coupon to: The F. E. Myers & Bro. Co., Ashland, Ohio.

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Street_____

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Myers PUMPS

WATER SYSTEMS AND WATER SOFTENERS

THE F. E. MYERS & BRO. CO. • Ashland, Ohio

AGAIN IN 1956

Eastman LEADS

NEW HAND WHEEL CONTROL

This NEW GEAR CONTROL has been engineered with STURDINESS, SAFETY and EASE of operation in mind as prime factors. The NEW HAND WHEEL CONTROL enables one man to operate the gun. It will hold in any position.

BOOTH 97
SPACE G
INTERNATIONAL FIRE CHIEFS CONFERENCE
MIAMI — FLORIDA

BE SURE!
. . to see the
EASTMAN
Demonstration Truck

See what EASTMAN equipment can do for your fire fighting problems

•

AT THE SHOW

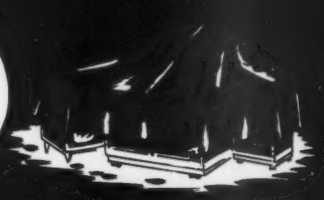
SAMUEL EASTMAN CO., INC.
CONCORD, NEW HAMPSHIRE

Superior Fire Fighting Apparatus for over 130 years

NOW! GET MORE PROTECTION

for salvage operations...for your equipment with lighter...tougher

by Sawyer®



America's No. 1 Vinyl-coated Nylon

Water is your best friend at any fire. But did you know that it causes 75% of the $1,000,000,000 damage done by fires every year! To get the best protection there is for salvage operations and for your equipment — protection against your enemy water, as well as smoke, chemicals and weather — get TUFF-TARP. No other covering material on the market offers the advantages of TUFF-TARP.

carries better — packs better!
folds easily, quickly!
sheds water better!
cleans better and faster!
dries much faster!
is easier to use under emergency conditions because it is waterproof on both sides!
is easier to move while unfolded!
spreads out easily, quickly!

in addition:

has greater flame resistance!
will not crack or peel at −30 F – +180 F!
will not mildew or rot!

Get the protection of **TUFF-TARP** *and you get the best!*

For complete details, contact . . .

THE H. M. SAWYER & SON CO.

A Division of SAWYER TOWER, Inc
Coated Fabrics Division, Watertown 72, Mass. WAtertown 4-0520

Hoosier can be your friend!

GET MORE DOLLAR VALUE

with salvage covers made of Sawyer's **TUFF-TARP**

when you make sure they're

FABRICATED

by

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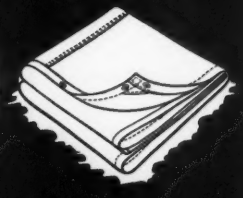


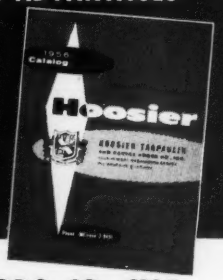
America's No. 1 Tarpaulin Fabricator

For fullest protection and greatest value for your money, you can't do better than HOOSIER salvage covers fabricated from TUFF-TARP! TUFF-TARP is truly excellent material for protection against water, smoke, chemicals and weather. But *High Quality Fabrication* is of prime importance too. HOOSIER tarpaulins of TUFF-TARP Nylon give you greatest durability, longest life, most for your money, because HOOSIER fabrication is the best there is!

ONLY Hoosier SALVAGE COVERS OFFER YOU ALL THESE ADVANTAGES

- ★ All seams double lock stitched for extra strength!
- ★ All seams double lapped felled for watertightness!
- ★ Triple thick 1½" flat hem on all four sides!
- ★ Triangular patch reinforcements in each corner!
- ★ Spur grommets grip and hold to prevent pulling out!

➡ WRITE FOR FREE CATALOG 57-F1



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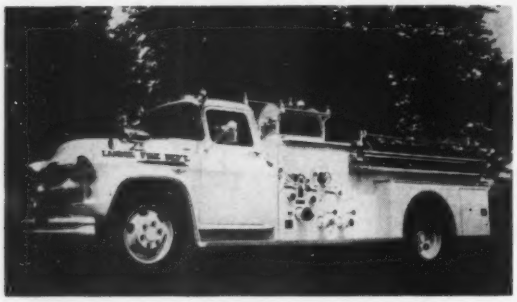
HOOSIER MANUFACTURES A COMPLETE LINE OF CANVAS SALVAGE COVERS

A Boyer 750 GPM Pumper, Skidmount Pump and Platform for Fire Fighting on the Move, GMC F455-8 Chassis

Delivered to Grant, Neb.

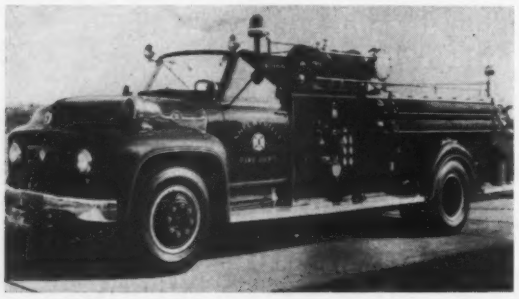


A Boyer 500 GPM Pumper, Catwalk Side Compartments for Easy Hose Loading, Chevrolet 10503 Chassis

Delivered to Lander, Wyo.

A Boyer 500 GPM Pumper, Large Hose Bed Capacity, Dodge C3-H8 Chassis

Delivered to Melville, La.



A Midwest 750 GPM Pumper, Cut Down Cab, Electric Reels, Ford F-800 Chassis

Delivered to Shelbyville, Ind.

A Midwest 750 GPM Pumper-Tanker 1000 Gal. Water, Diamond T636 Chassis

Delivered to Marlton, N. J.

A Midwest 500 GPM Pumper-Tanker 1000 Gal. Water, International R196 Chassis

Delivered to Lafayette, Ind.

A Boyer 1000 GPM Pumper, Quad. Shown, A Full Compliment of Ladders, Boyer Custom Chassis

Delivered to Sycamore, Ill.

LOOK TO US FOR FIRE FIGHTERS TO MEET YOUR COMMUNITY NEEDS

Unexcelled for Engineering & Workmanship
Exclusive Use of Powerful Hale Pumps

Built By UNIVERSAL

FIRE APPARATUS CORP.

SUCCESSOR TO BOYER FIRE APPARATUS CO.

LOGANSPORT **INDIANA**

A GREAT HOSE PROVED BY YEARS OF FIELD TESTING

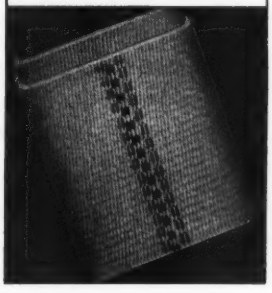
THE *American*

COTTON-SYNTHETIC JACKET *Hose*

400 AND 600 LB. TEST

50 FT. ORDINARY COTTON JACKET 2½ INCH

50 FT. AMERICAN COTTON-SYNTHETIC 2½ INCH
18% LESS WEIGHT
27% LESS BULK
50% STRONGER



Try this great new hose. See for yourself how its long-lived cotton-synthetic jacket and laminated natural rubber lining make for easy handling, while saving space and weight. Here's the story —

EASIER TO HANDLE—50′ of this AMERICAN Cotton-Synthetic Hose weighs 18% less than 50′ of average cotton jacket hose . . . enables firemen to move more hose faster. Also lies flatter, coils better, stays flexible wet or dry.

SAVES SPACE—AMERICAN Cotton-Synthetic enables you to carry at least 25% more hose.

STRONGER—High strength-to-weight ratio remains same wet or dry . . . tests prove it 50% stronger than regular hose.

Why lug heavy, bulky, hard-to-handle hose?
Order AMERICAN Cotton-Synthetic Jacket Hose—available in 400 and 600-lb. test—from your dealer NOW. . . or write us for details.

THE *American* RUBBER MANUFACTURING CO.

AR-26

MAKE SURE; Look for Identifying Stripe and Test Report

AMERICAN Cotton-Synthetic Jacket Hose has red, white, and blue identifying stripe. Each 50′ length is factory proof tested with couplings on, for strength, stretch, and twist. Test report accompanies hose.

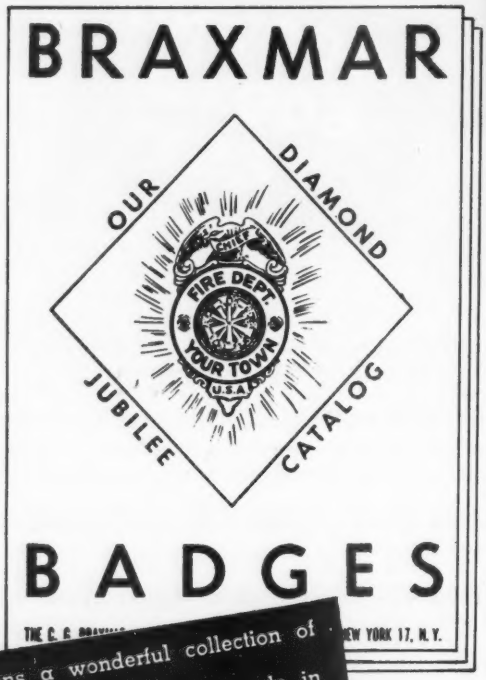
Factory & General Offices: • 1145 Park Avenue • Oakland 8, California • Phone OLympic 2-0800

The name to remember when buying badges . . . .

BRAXMAR

SINCE 1879 . . . .

we have supplied the fire field with the finest badges money could buy. Today . . . we offer the widest selection of badge designs . . . all skillfully made by men with a lifetime of experience in fine badge making. Any badge you select can be had in nickel, chrome plate, sterling silver, gold plate and rolled gold. You can depend on BRAXMAR experience and quality . . . highest in the field, since 1879.



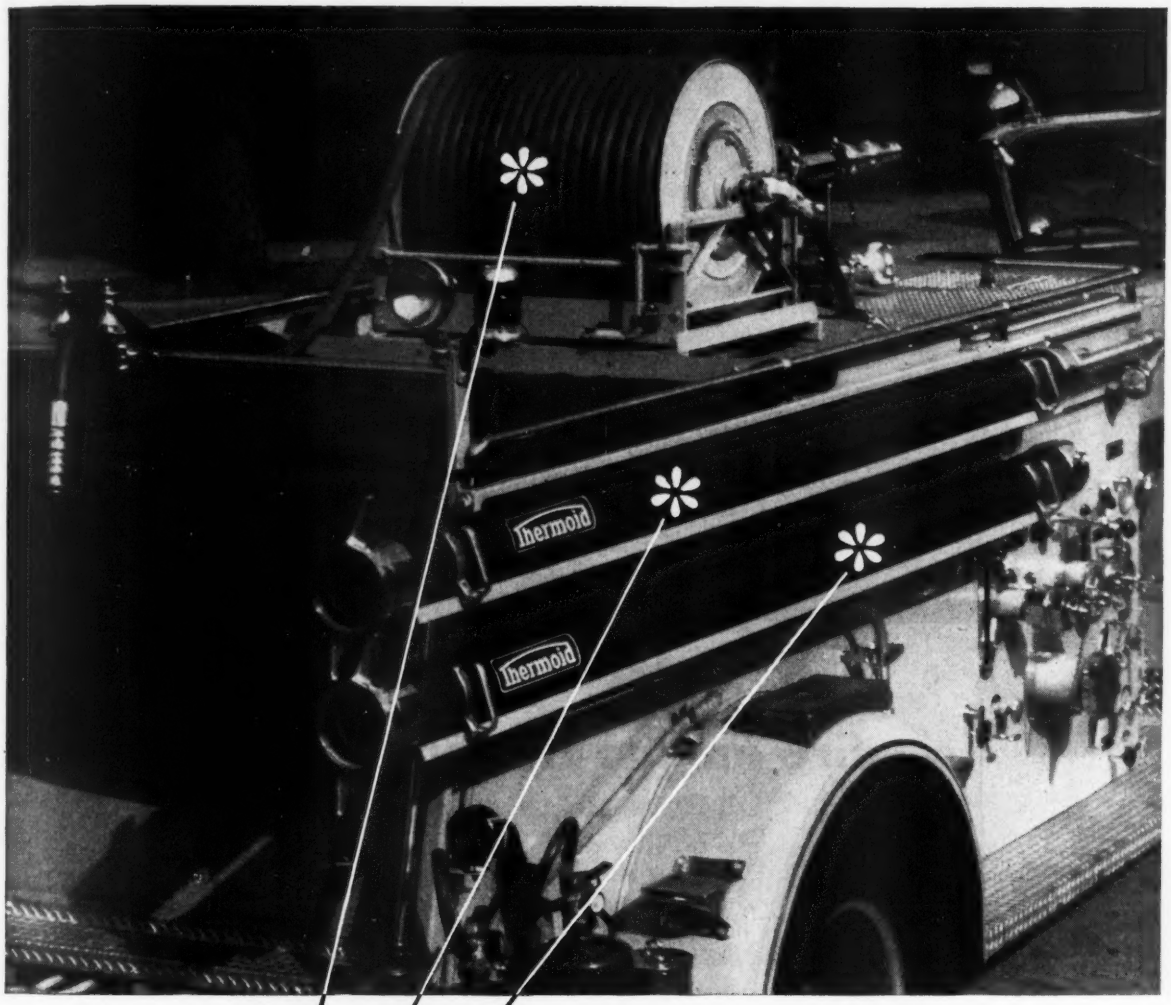
GET OUR CATALOG- YOUR BUYING GUIDE

It contains a wonderful collection of the finest badges we have made in our 75 years. It's yours for the asking — every fire company — every equipment dealer should have it. Please write on your company stationery —

THE C. G. BRAXMAR CO., Inc.

JOHN O. VEIT *President* — **JOHN O. VEIT, JR.** *Secretary-Treasurer*

DEPT. F—216 EAST 45th ST., NEW YORK 17, N. Y.



Be sure the hose is Thermoid!

No matter how well a modern pumper is built, its effectiveness is entirely dependent on the hose that takes in and delivers water. Quality, a basic specification of all equipment builders, is engineered into every length of Thermoid Hose.

Thermoid Fire Engine Suction Hose

A smooth bore, flexible, fabric wrapped hose, reinforced with steel wire, imbedded in a heavy reinforcement carcass. Thermoid Hose is manufactured to exacting specifications to assure perfect coupling fit.

Thermoid Red Devil Booster Hose

A lightweight hose with design that limits contraction under pressure, insuring safe reel operation. Durable 3 braid reinforcement covered with special compounded cover that resists oil, grease, abrasion. Working pressures to 800 psi.

Get the facts now. Contact your Thermoid Distributor or write direct to factory.

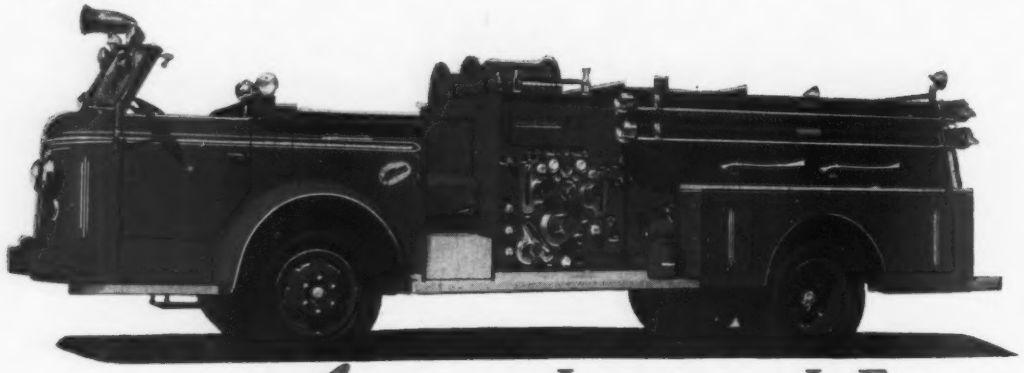
Thermoid

Thermoid Company, Trenton, N. J.

Wrapped and Molded Hose • Belting • Brake Linings • Friction Materials • Precision Process Molded Products

The NEW . . ALL NEW "Series 800"

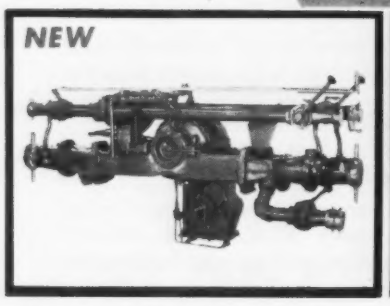
The Custom . . .



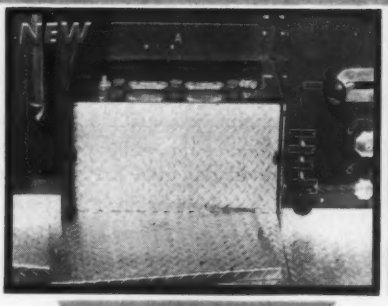
Again AMERICAN LAFRANCE

fire engine design, performance

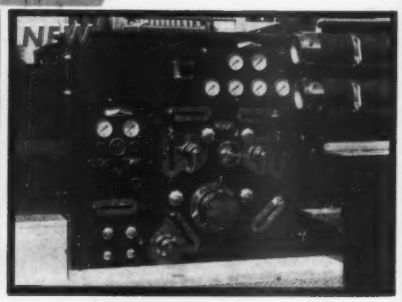
The new American LaFrance 800 Series Fire Engines are new from front bumper to rear step. The Cab-Ahead-of-Engine design has proven best for safety and driver's visibility through eight years of fire service. The chassis is completely new with heavier frame, longer springs and direct acting shock absorbers. Short turning radius and easy steering are important features in the new design. Utility, always important, is increased by greater hose capacity of the 73 inch wide body, and the addition of seven enclosed compartments and two open compartments to protect all the equipment. The standard water tank has been increased to 300 gallons (U.S.) capacity.



New parallel-series TWINFLOW centrifugal pump, more water per engine horsepower, longer service life with decreased maintenance. All controls positive operation. Gated suction inlet optional on specification.



New battery location away from engine heat; short leads for high voltage; accessible for inspection and testing; 12 volt heavy duty 150 amp. hour battery for all electrical requirements.



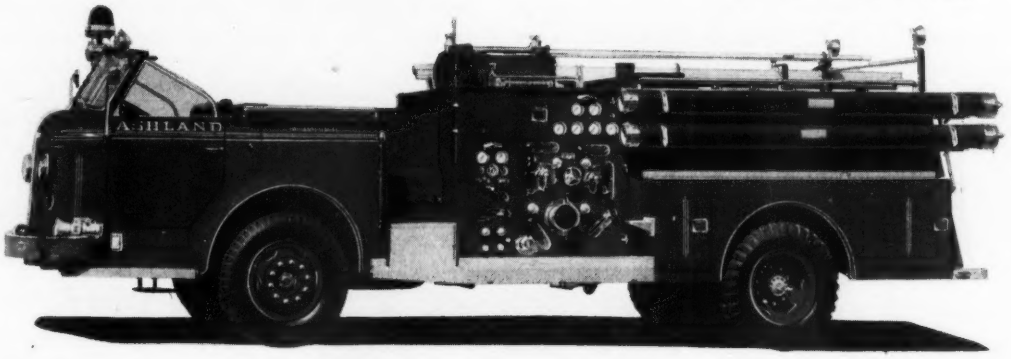
All gauges, valves and pump controls grouped for best operation; properly identified with permanent plates and protected from freezing. Extra gauges and gates shown are optional equipment as specified.

See one of these new American LaFrance "800 Series" Fire Engines in Space A and get complete details in our booth No. 62 at the I.A.F.C. Convention in Miami, November 12, 13, 14, 15.

AMERICAN LAFRANCE

FIRE ENGINES

The Deluxe...

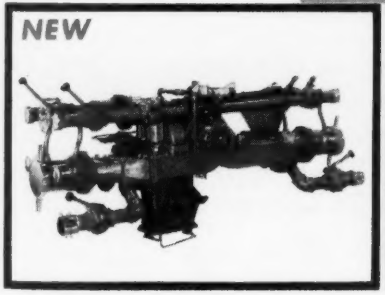


sets a new high standard in and utility . . .

The American LaFrance high standards of quality in materials, design and workmanship characterize the new 800 Series Fire Engines. Every model, either Custom or Deluxe, is identical in chassis construction. The Deluxe differs only in finish (lacquer), style of trim, compartment detail and bronze pump housing.

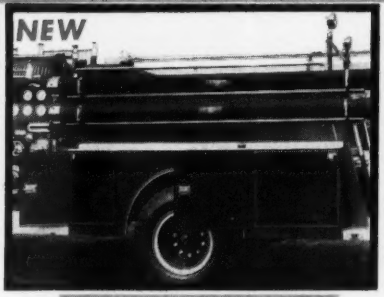
Seven engines provide a complete range of power selection for top performance under all service conditions. Two engines are V-12 and five engines are 6 cylinder. The new TWINFLOW pump is available in all standard N.B.F.U. Class A capacity ratings and is now proving its high performance ability in fire service use. Higher pressure performance up to 600 p.s.i. pressure is provided on specification.

NEW



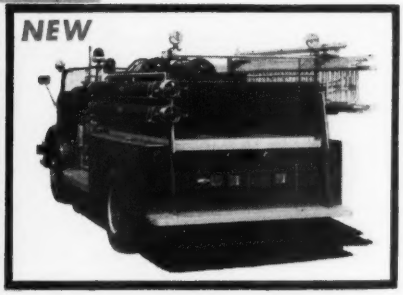
TWINFLOW pump has optional controls from right or left side of apparatus. All discharge gates controlled from operator's panel. All lubrication from operator's panel. Gated suction inlets optional on specification.

NEW



Four large enclosed side compartments for masks, inhalators and other equipment requiring weather protection. Deluxe specifications include waterproof doors with lights in compartments controlled by door operated switches.

NEW



Two large enclosed compartments provided at rear. Each compartment adequate for portable generator, portable pump or other equipment. Center compartment enclosure and rear discharge outlets shown are optional.

AMERICAN LAFRANCE CORPORATION

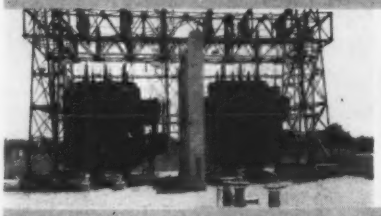
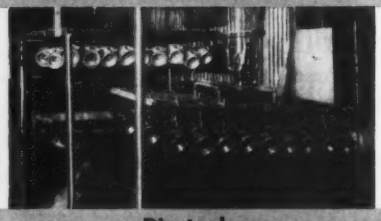
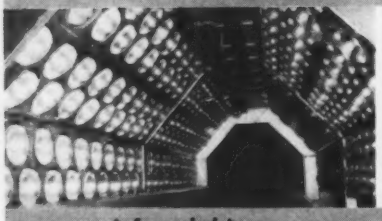
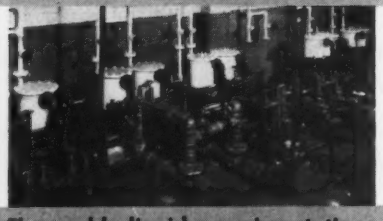
ELMIRA, NEW YORK, U. S. A.

LAFRANCE FIRE ENGINE and FOAMITE LIMITED

TORONTO, 9, ONTARIO, CANADA

SPECIAL GRINNELL FIRE PROTECTION SYSTEMS
for those extra hazardous plant areas

Practically every manufacturer has what we call "special fire hazards" — extra hazardous areas in his plant where special protection must be provided to insure against possibly serious loss by fire. Some of these hazards are illustrated below, along with the special fire protection systems recommended to arrest fire without delay. And there are many other hazards, too, where major or minor supplements to ordinary-hazard fire protections systems are a positive "must" — if trouble is to be safely avoided. Grinnell, with 87 years experience protecting against fire hazards of every description, has a fire protection system for every need. Moreover, the installation of the proper Grinnell System usually serves to reduce fire insurance premiums drastically, often pays for itself in a few years. Here's a check list of extra hazardous areas found in many plants:

SPECIAL FIRE HAZARD		RECOMMENDED SYSTEM
 Transformers	Propane tanks	**WATER SPRAY** Grinnell ProtectoSpray; Grinnell Mulsifyre Systems
Bulk oil storage tanks	Flammable chemicals storage	**FOAM** Grinnell ProtectoFoam System
Engine test cells	 Dip tanks	**CARBON DIOXIDE** Grinnell CO_2 System
 Infrared driers	 Flammable liquid pumping stations	**DRY CHEMICALS** Grinnell Dry Chemical System

With a full range of equipment, you are assured of unbiased recommendations which will be fitted to your requirements. Grinnell Company, Inc., 287 West Exchange St., Providence, Rhode Island.

GRINNELL

WHENEVER FIRE PROTECTION IS INVOLVED

Manufacturing, Engineering, and Installation of Fire Protection Systems since 1870

MAXIM AERIALS

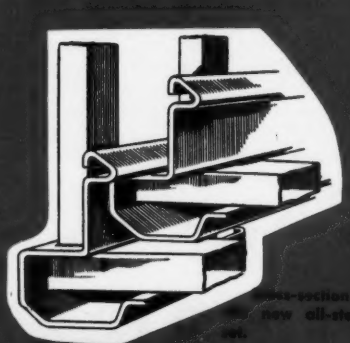
Greatly Increase Rescue — Utility — Safety —

No other ladder in America can be compared with the MAXIM-MAGIRUS for length, strength, safety and mechanical excellence. Built on short wheelbase, it can get in and out of places completely inaccessible to conventional aerials. Let us send you further data.

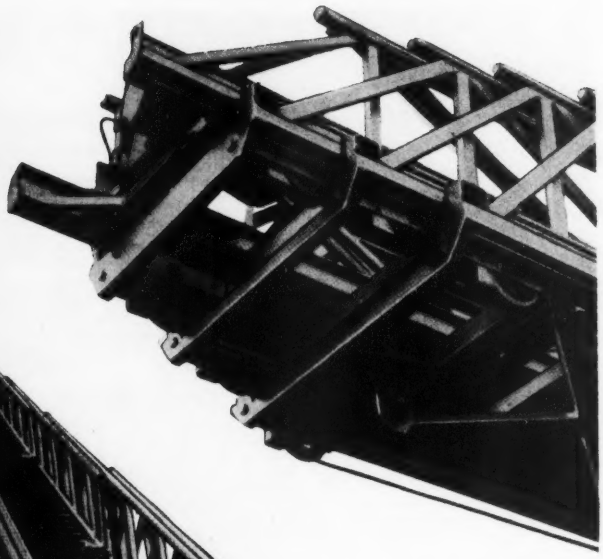
MAXIM MOTOR COMPANY

The World's Finest Fire Apparatus

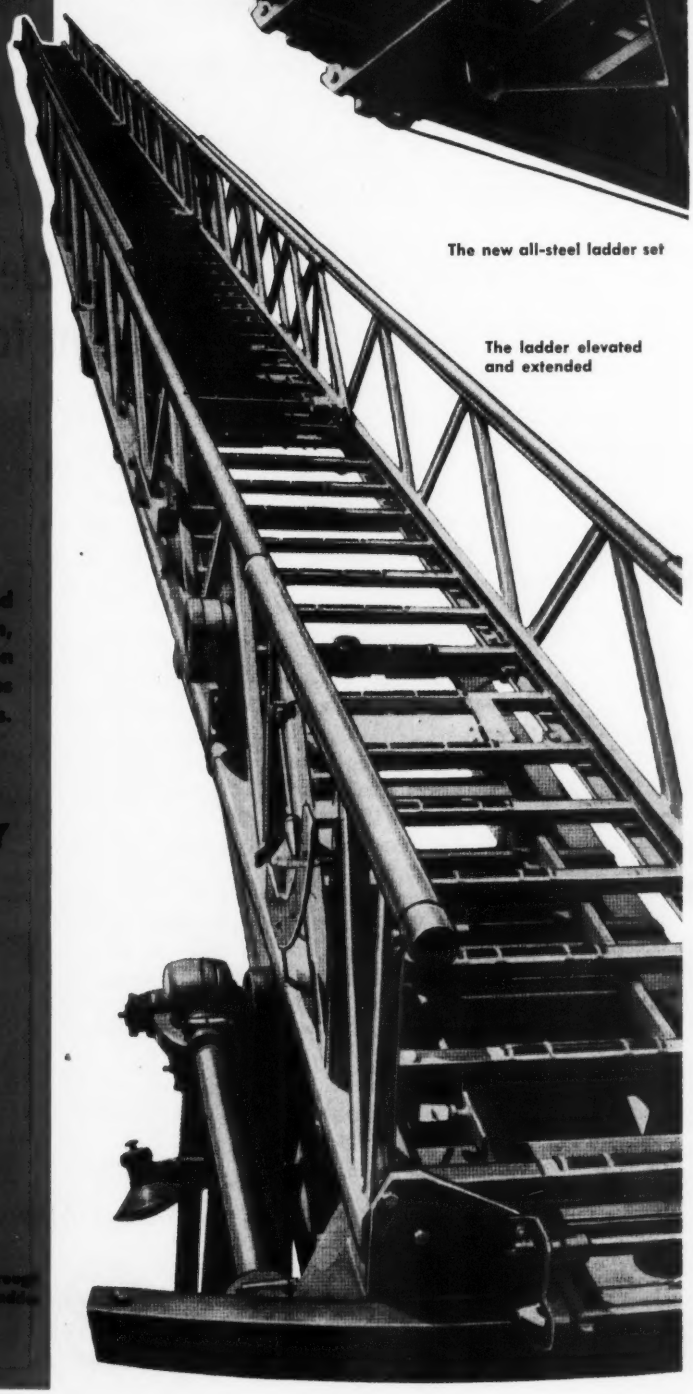
MIDDLEBORO, MASSACHUSETTS



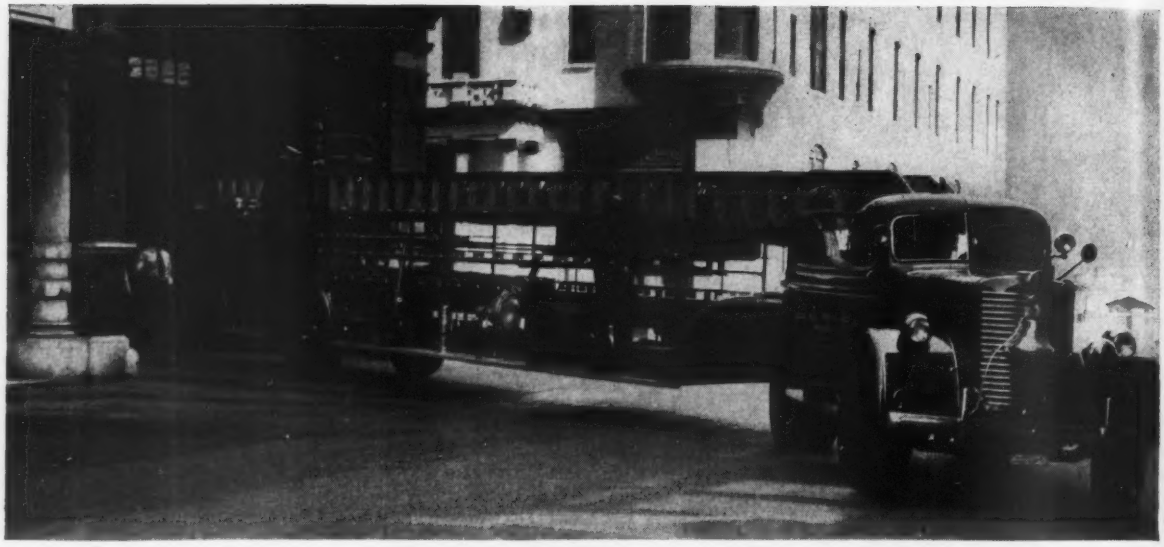
cross-section through new all-steel ladder set.



The new all-steel ladder set



The ladder elevated and extended



Knoxville selects General Electric Progress Line Two-Way Radio System for fire protection

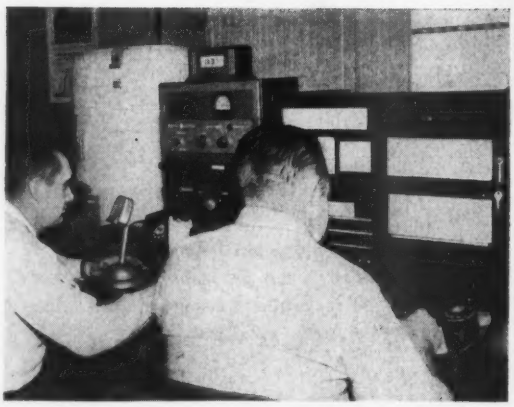
Knoxville, Tennessee, selected General Electric's Progress Line two-way radio for its Fire Department because it offers highest reliability with lowest maintenance cost. High fidelity communication is assured by the controlled reluctance microphones, standard on all Progress Line radios. And only General Electric two-way radios are equipped with 6600 series pre-tested, long-life communication-type tubes.

According to James Swanner, Superintendent of Fire Alarms, solid radio contact can be maintained between his base radio station and that of the Chattanooga Fire Department—114 miles away. He explained that this contact was requested by Civil Defense authorities to tie together fire fighting facilities of the two cities in event of disaster. General Electric Communication Engineers placed the Knoxville base station atop a ridge several hundred feet above surrounding terrain, to assure meeting the CD requirement.

All of Knoxville's fire stations are tied together by the radio system. In addition, 15 engines, a Civil Defense emergency truck, ambulance, and cars of the Chief, Assistant Chief, Superintendent of Fire Alarms, two inspectors, and a mechanic are now smoothly coordinated by two-way radio. This progressive Fire Department has already demonstrated many times how General Electric two-way radio provides improved fire protection for the Knoxville metropolitan area.

* * *

Your use of two-way radio can save money for taxpayers in your city through reduced municipal fire insurance rates for cities with radio-equipped fire departments.



Dispatchers at Knoxville Fire Department Headquarters handle all telephone and two-way radio coordination. All fire station and key vehicles are coordinated via new General Electric two-way radio system.

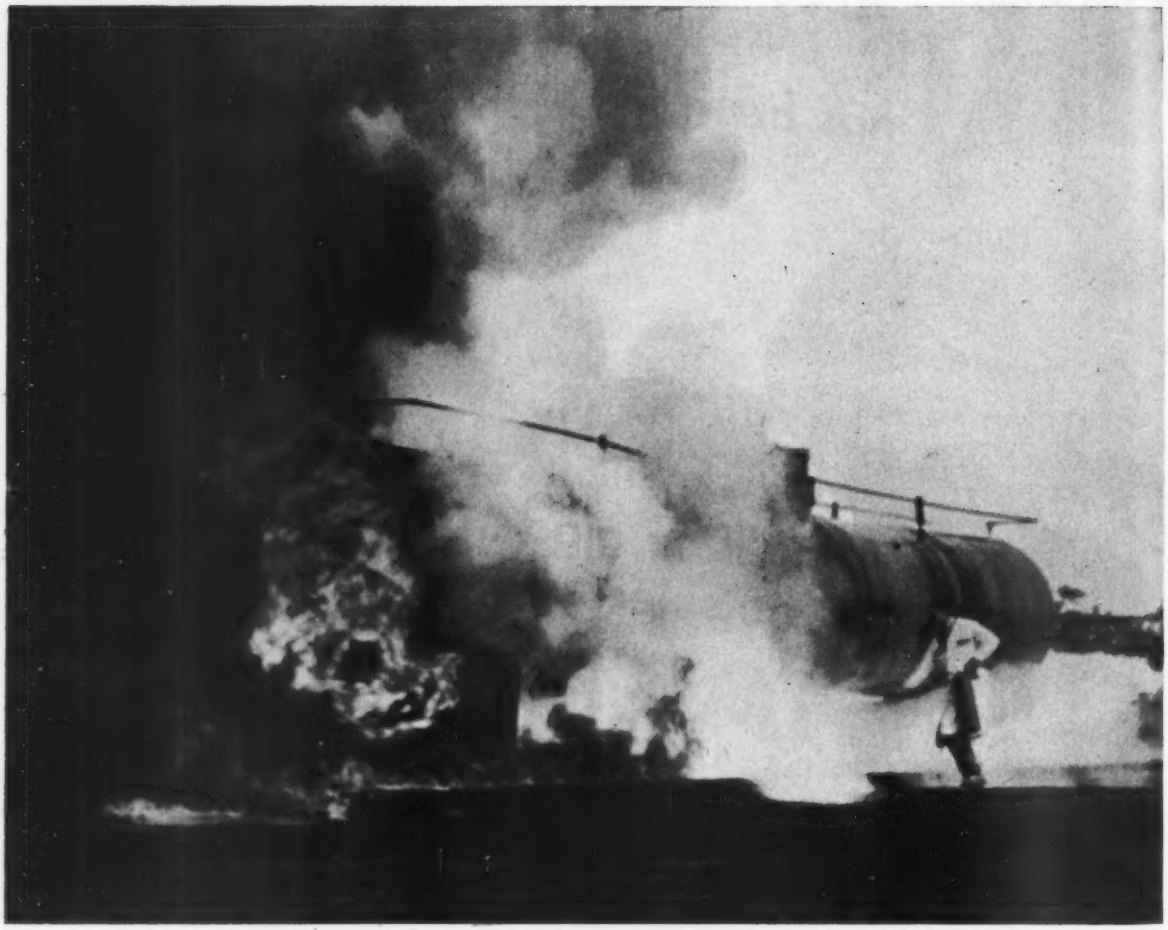
For Sales and Service...see "Radio Communication Equipment" in your yellow pages. Or, write: General Electric Co., Communication Equipment, Section X59106, Electronics Park, Syracuse, N. Y. *In Canada:* C.G.E. Electronics, 181 Landsdowne Avenue, Toronto.

Progress Is Our Most Important Product

GENERAL ELECTRIC

long...long after
the purchase price
has been forgotten
you'll be glad
you selected-
MAXIM
We design and build a complete line of the finest fire apparatus money can buy . . . pumpers 500 to 1500 GPM — aerials 65' to 100' and Maxim Magirus 100' to 170'
MAXIM MOTOR COMPANY
MIDDLEBORO, MASSACHUSETTS

BIG FIRE?



*30,000 Gal. Fuel Tank at New Haven, Fire Dept. Training Grounds

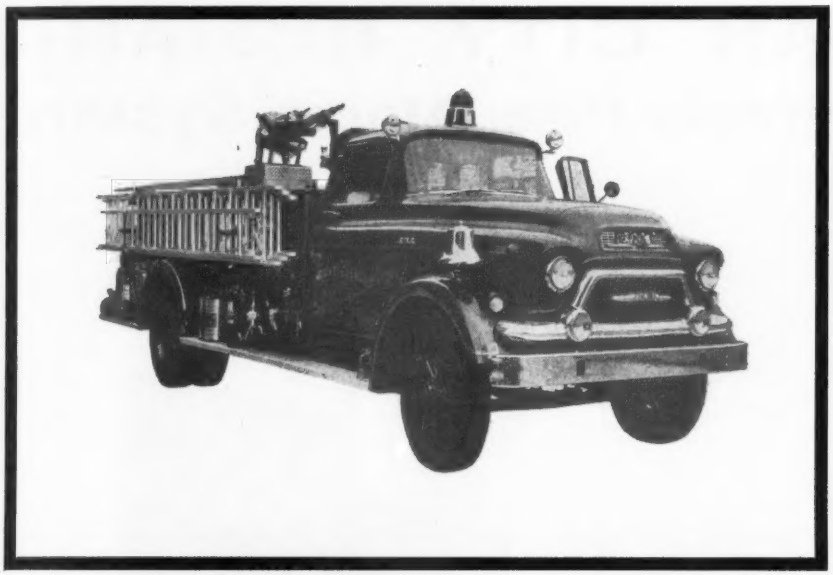
YOU BET IT IS...

. . . and Safe-T-meter *high-pressurized*
DRY CHEMICAL fire extinguishers,
with longer range, can handle it!

NATION-WIDE SALES AND SERVICE

Safety First

PRODUCTS CORPORATION
ELMSFORD, NEW YORK



Another

Masterpiece

ALL FIRE MASTER FIRE TRUCKS
ARE
ARTISTICALLY DESIGNED, ENGINEERED AND PRODUCED
BY MASTER CRAFTSMEN

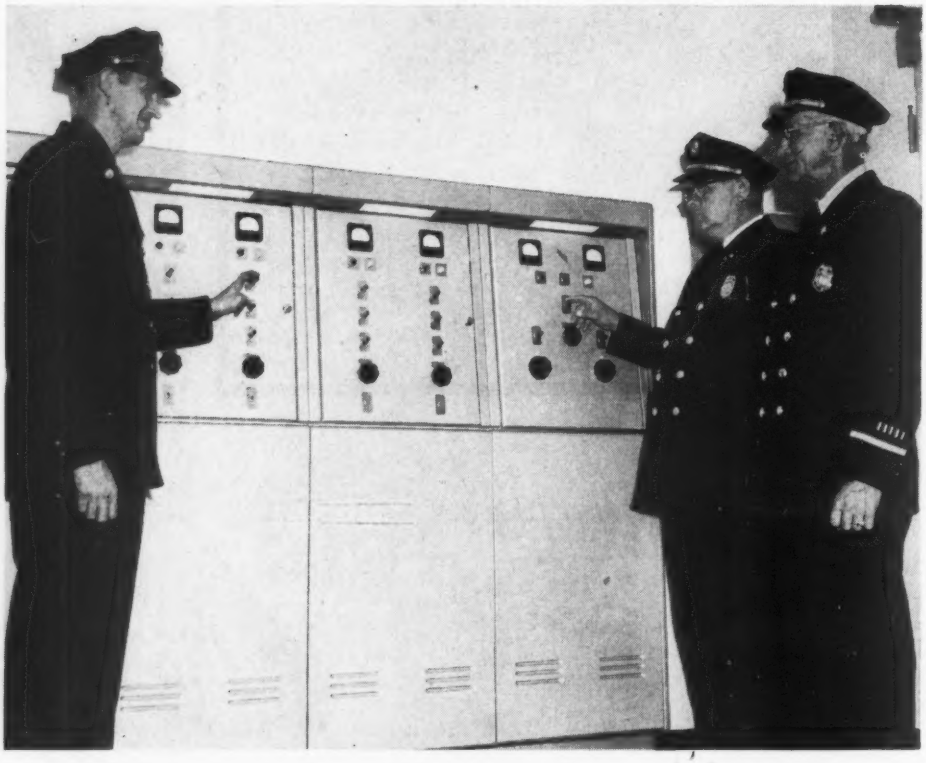
FIRE MASTER CORPORATION

In The Motor City Area
MT. CLEMENS, MICHIGAN

Congratulations to...

MICHIGAN CITY, INDIANA

Safa Telegraph Fire Alarm System



Chief E. J. Noveroske, Capt. E. G. Heffner and E. Hoffman inspecting Michigan City's new telegraph system.

The City of Michigan City through extensive fire engineering analysis and study unanimously resolved to install a new modern SAFA telegraph fire alarm system.

Other cities who recently chose to install SAFA telegraph systems:

Alexandria, Va.	Morristown, N. J.	Rockland, Me.
El Cerrito, Cal.	North Easton, Mass.	Salamanca, N. Y.
Ilion, N. Y.	Regina, Sask. Canada	Waldwick, N. J.
Lafayette, La.	Riverdale, N. J.	Wolfesboro, N. H.

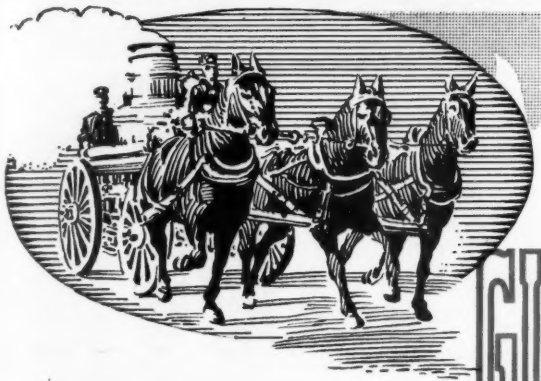
OUR TECHNICAL KNOW-HOW IS AT YOUR DISPOSAL.

SAFA ALARM DIVISION, INC., THE *Fyr-Fyter* COMPANY

EXECUTIVE OFFICES: ORRVILLE, OHIO

SALES OFFICES

ATLANTA • BOSTON • CHICAGO • DALLAS • LOS ANGELES • NEW YORK • NEWARK • SAN FRANCISCO



LEADERS FOR OVER 55 YEARS . . .
SUITS FOR FIRE CHIEFS AND FIREMEN

GLOBE

Since 1901

Proven in use throughout the world for the last 55 years, the GLOBE SUIT is standard for maximum protection, and really needs no introduction at all. Every garment is absolutely guaranteed to give years of dependable service. This guarantee we make unconditionally because we know that Globe Suits have proven outstanding in tough fire service.

GLOBE SUITS are made from only the toughest, stoutest fabrics . . . yet they are light, flexible, waterproof* and comfortable. They are designed and constructed for your safety in action.

in BLACK
WHITE
BROWN
or RED

**Interlinings made with 100% Du Pont Neoprene.*

See them at your dealer's or write for our catalog.

STANDARD SINCE 1901

GLOBE MANUFACTURING COMPANY PITTSFIELD, NEW HAMPSHIRE

BY POPULAR DEMAND—THE CHRISTOPHER RES-Q

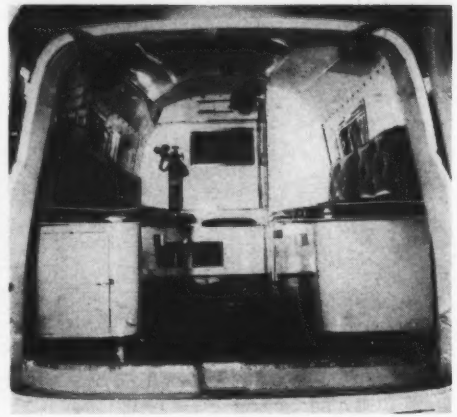
RES-Q recently delivered to West Bend Fire Dept. West Bend, Wis.

THIS FAST, DYNAMIC, MULTI-PURPOSE, DISASTER VEHICLE IS ENGINEERED AND DESIGNED TO MEET YOUR DEMANDS!

20 COMPARTMENT AREAS—

for all types of emergency equipment including Portable Generator, Pump, Oxy-Acetylene, Resuscitators, Inhalators, Reels, Floods, Winch, Tools, etc.

Note compartment above rear step, it's also accessible from both sides thru fender openings. This compartment can house rear mounted winch, thus eliminating unsightly appearance of front mount.



Interior seats 12 men and 4 stretcher patients—when not in use stretchers and blankets are stored behind hinged lazybacks. Interior lined with formica, foam rubber seats and backs are art leather covered. Note storage area—floor compartment—2 side compartments—heater with seat above it and medicine cabinet to right. Both side compartments can be made accessible from outside.

HOLDS 4 STRETCHER PATIENTS!

Seats 12 men plus driver & attendant. Hailed by Fire Chiefs—acclaimed by Civil Defense—"RES-Q" combines into one vehicle, an AMBULANCE, SQUAD CAR and RESCUE-PATROL. This same unit is also available with 200 or 500 gpm pump, 150 gallons of water, stainless steel foam tank with automatic proportioner, 2½" suction and discharge valves on both sides, 250' of ¾" high pressure chemical hose, 200' of 1½" hose, etc. (ask for our FAPA model), can be had in ANY COMBINATION desired, (Write us for full details specifying your requirements) V-8, hydramatic, power brakes, and power steering are available.

Compartments open curb side. (Also available with compartment on drivers side)

THE CHRISTOPHER CO.

66-70 BEAVER ST., NEW YORK 4, N. Y.

THREE CERTIFIED LABORATORY REPORTS PROVE IT!

CM-7

is remarkably SAFE*

* Certified Laboratory Report Number One ...

"These tests were designed to determine whether or not CM-7 completely inhibited the formation of carbon monoxide when adequately applied in a liquid or vapor form to a fire atmosphere most favorable to the formation of carbon monoxide. By testing CM-7 by this, as well as other methods, I found that CM-7 completely inhibits the formation of carbon monoxide when adequately applied to fire in either liquid or vapor form."

* Certified Laboratory Report Number Two ...

"Based on my extensive study and tests, CM-7 cannot result in lethal quantities of toxic gases when used to extinguish fires and which, in fact, when so used, tends to retard the normal toxic gases produced by fire itself.

Phosgene gas in toxic quantities cannot result from the application of CM-7 to a fire, whether the application be in liquid or vapor form.

The by-products of CM-7 in combustion are the non-toxic type and, in themselves, constitute effective fire extinguishing agents."

* Certified Laboratory Report Number Three ...

"I have repeatedly tested Red Comet's new vaporizing liquid known as CM-7 under conditions favorable to the formation of phosgene gas and have found that toxic quantities of phosgene gas cannot result from the application of CM-7 vapor or liquid to hot steel, burning embers or other fire conditions. The tests employed the use of a modern scientific phosgene detection method which is so exact it will indicate the presence of only 2 parts of phosgene in one million parts of air. The results of these tests were negative as no phosgene was detected."

* All 3 complete laboratory reports will be mailed to you on request.

COMPARATIVE TESTS SHOW STARTLING DIFFERENCE..

CM-7 EXTINGUISHING FLUID

CM-7 cannot result in deadly quantities of toxic gases when used to extinguish fires and also tends to retard normal toxic gases produced by fire.

CM-7 penetrates burning embers of wood, textiles and other Class A fires more deeply than any other common type of vaporizing liquid on the market.

Phosgene gas in toxic quantities cannot result from the application of CM-7 to any fire, whether the application be in liquid or vapor form.

OTHER COMMON TYPES

Carbon Tetrachloride, the standard extinguishing fluid, produces 10% to 20% less vapor than CM-7.

Carbon Tetrachloride or Chlorobromomethane are different chemical compositions than CM-7.

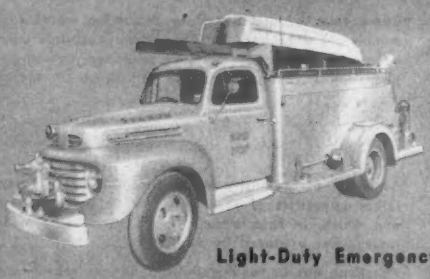
Laboratory tests between Carbon Tetrachloride and CM-7 . . show why CM-7 is so much more effective. Carbon Tet. boils at 170°F, CM-7 at 152½°F . . this means CM-7 vaporizes and starts work faster. The by-products of CM-7 in combustion are NON-TOXIC and effective fire extinguishments.

A ... Product of RED COMET, INC. Littleton, Colorado

Semi-Closed Rescue Truck

ASK SHARPSVILLE TO HELP YOU
SET YOUR SPECIFICATIONS HIGH ENOUGH
TO GUARANTEE SATISFACTION—
AT BUDGET COST

Closed Squad Car


Light-Duty Emergency Car

Challenger Tanker

Sharpsville
STEEL FABRICATORS, Inc.
SHARPSVILLE, PA.

★

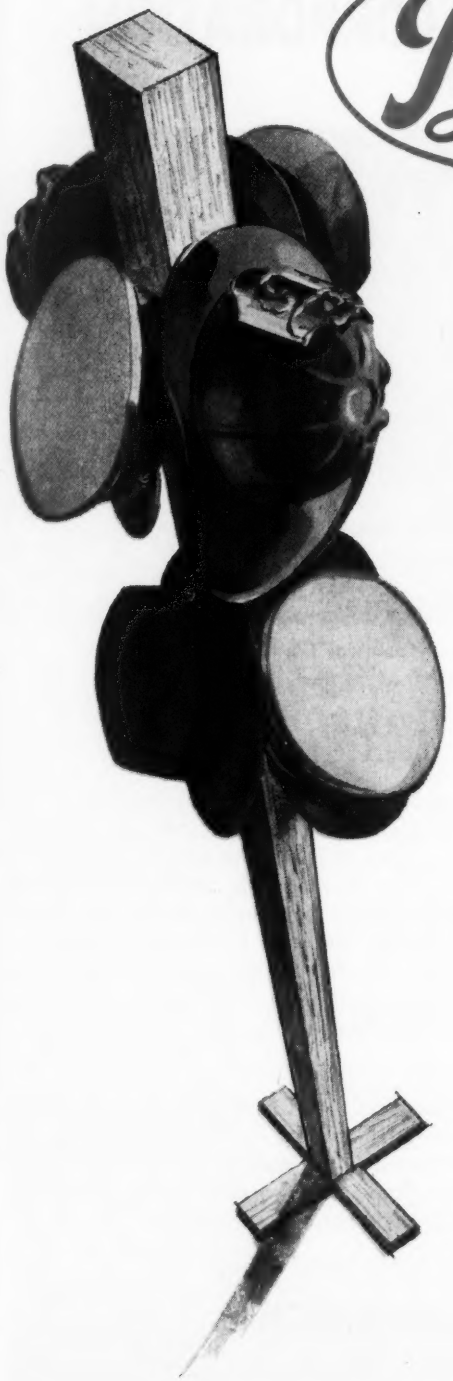
BUILDERS OF SERVICE, CRASH AND LADDER TRUCKS
VOLUME AND HIGH-PRESSURE PUMPERS
SQUAD AND EMERGENCY CARS • TANK TRUCKS

Custom Challenger

THE FINEST NAME IN FIRE PROTECTION...

TRADE MARK
Pyrene
REG. U.S. PAT. OFF.

TRADE MARK
C-O-TWO
REG. U.S. PAT. OFF.



WELCOMES YOU

TO THE 83rd ANNUAL CONFERENCE OF THE INTERNATIONAL ASSOCIATION OF FIRE CHIEFS, MIAMI, FLA., NOV. 12-15

Pyrene-C-O-Two salutes the men who are a part of this important conference! The ideas, thoughts and suggestions of this meeting may well form the keystone for new areas of more effective fire protection.

Although modern fire protection methods have been developed to an amazing degree of effectiveness, the nation's fire loss in 1955 was a staggering 885 million dollars! Pyrene-C-O-Two, ever conscious of the disastrous effects of fire, has come far in the development of portable extinguishers for every fire hazard, built-in smoke detecting devices, engineered extinguishing systems and a complete line of brass goods and hose. But, the constant growth of our industrial regions, plus the constant development of new and highly volatile materials places fire protection in a position of even greater importance.

With this in mind, Pyrene-C-O-Two welcomes everyone to the 83rd annual conference . . . with the hope for new achievements in providing better fire protection!

PYRENE-C-O-TWO DIVISION
THE FYR-FYTER COMPANY
NEWARK 1, NEW JERSEY

BRANCHES IN: ATLANTA, CHICAGO, DALLAS and SAN FRANCISCO

One Of The World's Largest Highways

Chooses Apparatus Manufactured By—

YOUNG FIRE EQUIPMENT CORPORATION

One of the 23 specially designed fire-crash trucks built for the New York State Thruway Authority undergoing tests at Amsterdam, New York.

Realizing the possibility of having to cope with fires of almost every conceivable combustible material, the NYSTA ordered 23 of these fire-crash trucks to offer the best possible protection at the least possible cost.

Under the very capable guidance of Messrs. Marhlon Dapson, Superintendent of Thruway Maintenance, Arnold Fisch, Traffic and Safety Engineer, John Pendleton, Assistant Superintendent of Highway Maintenance, W. L. "Army" Armstrong, and Al Mullen, Rockwood Sprinkler Company, Thruway personnel are thoroughly instructed in the use and operation of these vehicles on test fires and in classrooms.

Featuring simplicity of operation and hard-hitting power, these vehicles offer an extinguishing agent for almost all types of fires. Such component parts as bumper and turret nozzles, dual electric rewind booster reels, dual suction foam and wet water proportioning system, four-stage turbine type centrifugal pump, 330 gallon booster tank, 1½ in. side discharge, bayonet piercing and fog foam applicators for booster lines and 1½ in. line, remote control of pump and operating valves adds up to a hard-hitting vehicle ideal for a first line fire truck for municipal, rural, industrial, and airport fire protection.

For economy of initial cost and operation, for hitting power and simplicity, for the vehicle designed to get there in a hurry and wallop a fire before it reaches tremendous proportions, write to us today for complete details and prices.

YOUNG FIRE EQUIPMENT CORPORATION

1546-52 William Street, Buffalo 6, New York

BUILDING QUALITY FIRE APPARATUS FOR FIRE DEPARTMENTS SINCE 1934.

This is a special invitation to all in attendance at the Miami Conference of the International Association of Fire Chiefs to visit our exhibit booth #16 and inspect the *New Powhatan* 1½" *Municipal Fog Nozzle.*

Nothing in engineering and research has been spared in the creation of this fine nozzle. We truly believe it to be the Fog Nozzle of the future.

POWHATAN

BRASS & IRON WORKS

Ranson, West Virginia

Now! 3 Alco-Lite Ladders for short wheelbase Pumpers... Old or New

Shown above is an Alco-Lite Pumper Roof Ladder and 2 Section Extension Ladder nesting in brackets designed for wood ladders. The nested thickness of the two is 6⅞". This pair not only makes an ideal replacement on old Pumpers but is very desirable equipment on new Pumpers.

3 Section Pumper Extension Ladder

The newest addition to the Alco-Lite Pumper series is a 3 Section Pumper Extension Ladder which is made in 30′ and 35′ models. Only 7″ thick, the 3 PEL will nest by itself in brackets found on most Pumpers. On new Pumpers, the 3 PEL can be specified to nest with an Alco-Lite Pumper Roof Ladder. The 3 Section Pumper Extension Ladder has a rope and cable arrangement which allows the ladder sections to extend simultaneously. It is also equipped with spring loaded locks which operate automatically at any desired point.

Always specify Alco-Lite Aluminum Ladders

Alco-Lite Pumper Ladders are stronger and easier to handle because they are made of high tensile strength, industrial, aluminum alloy. Their deeply grooved, 1¼", rungs are permanently attached to the extra heavy gauge, double channel, side rails with expansion bushing construction. Alco-Lite Pumper Roof Ladders feature, in addition, extremely strong, folding steel hooks.

original manufacturer of aluminum ladders

ALCO-LITE

Aluminum Ladder Company

WORTHINGTON PENNSYLVANIA

BLAZE GUARD SCORES AGAIN!

A NEW INVENTION-

is now offered by BLAZE GUARD, industry leader in increases of volume production, nation-wide distribution and acceptance of fine fire hose, 'GATER HIDE, GOLDEN FALCON, BLAZERON, GUARDRON, and MASTER GUARD.

BLAZE GUARD ENGINEERS declare that this invention will revolutionize present methods of handling and operation of fire hose. "It will be as important to a fire hose user as was the self-starter to the automobile owner," they declare.

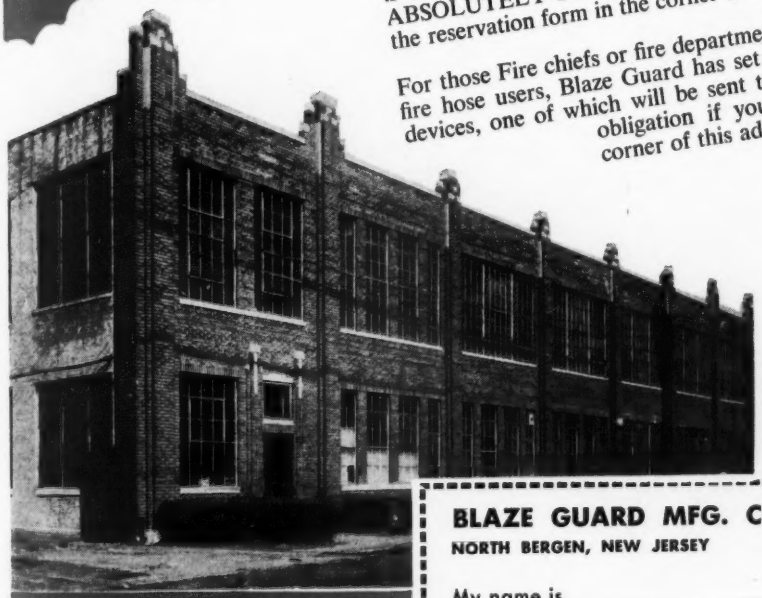
There is nothing else like this device on the market today. From Blaze Guard, and ONLY Blaze Guard, will it be obtainable.

ON BEHALF OF DISTRIBUTORS, AND IN GRATEFUL APPRECIATION TO HUNDREDS OF FIRE DEPARTMENTS THROUGHOUT THE NATION, BLAZE GUARD WILL SEND ONE OF THESE EXTRAORDINARY DEVICES TO YOU, ABSOLUTELY FREE!

For YOU, THE FIRE CHIEF, or the fire department, now using BLAZE GUARD brand fire hose, 'GATER HIDE, GOLDEN FALCON, BLAZERON, GUARDRON, or MASTER GUARD, there is reserved one of these wonderful devices. It will be sent to you ABSOLUTELY FREE, when your name and address is entered on the reservation form in the corner of this ad.

For those Fire chiefs or fire departments who are not yet Blaze Guard fire hose users, Blaze Guard has set aside a limited number of these devices, one of which will be sent to you absolutely without cost or obligation if you submit the form in the lower corner of this advertisement.

Send in your name and address while the supply lasts.



Home of Blaze Guard

FIRE HOSE IS OUR ONLY BUSINESS

BLAZE GUARD MFG. CO.
NORTH BERGEN, NEW JERSEY

(RESERVATION)

My name is _____ Title _____

Department _____

Street Address _____

City & State _____

We have in use the following lengths of hose:

(Please give approximate number of lengths of each different brand of fire hose you have in your department.)

POWER TO BEAT THE BIG BLAZES...

POWER IN RESERVE—to operate pumps hour after hour with no fear of breakdown.

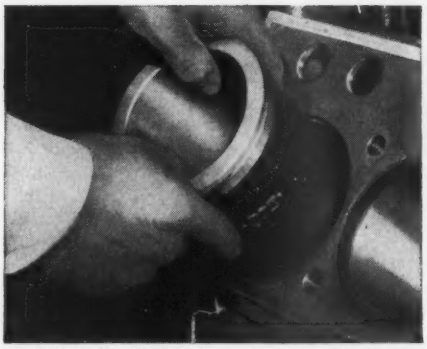
DEPENDABLE POWER—that's always ready to go the moment an alarm sounds. Exclusive Reo oil temperature stabilizer assures faster warm up—keeps oil cool under adverse operating conditions. Maintains oil temperature within 35° of engine coolant.

RESPONSIVE POWER—for fast acceleration—quick getaway, levels hills and grades, makes every vital second count!

ECONOMICAL POWER—that gives greater operating efficiency, longer life.

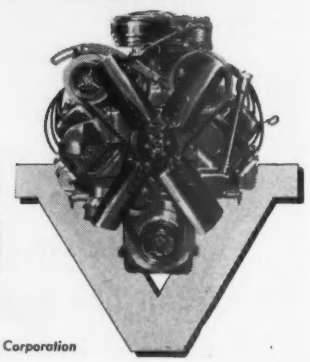
That's the Reo A-607—engineered and built exclusively for use with commercial pumpers to provide your community with the best in fire protection at an economical cost. Reo's 100,000 MILE or 1 YEAR ENGINE WARRANTY is your assurance of power and performance never before experienced.

Before you order your next fire truck—be sure to investigate Reo. For detailed information, see your nearest Reo representative, write or wire Reo Motors, Inc., Lansing, Michigan.



REO'S WET SLEEVE construction of special alloy steel extends engine life almost indefinitely, cuts time and cost of overhauls 50% because no reboring or piston fitting is required. Another Reo exclusive!

MODEL A-607 — Fire Truck Chassis—235 h.p. V-8 engine—.534 h.p. per cu. in. displacement—as much as 35% above the industry average. Fire truck chassis also available with Reo's famous Gold Comet 6-cylinder engines.

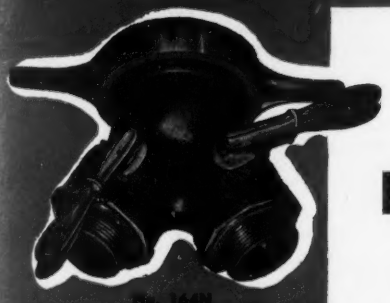


REO BIG V

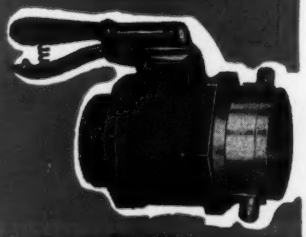
REO MOTORS, INC. LANSING 20, MICH. • TORONTO, ONTARIO, *Subsidiary of* BOHN *Aluminum and Brass Corporation*

Headquarters for Fire Department

BRASS GOODS



No. 164N
4½" swivel female x two 2½" male Gated Siamese. Quick opening, non-rising stem valves.



No. 162
Made either Right Hand or Left Hand 2½" male x female, gate valve.

McINTIRE BRASS WORKS

Pioneers in Nozzle Manufacture
ORIGINATORS
and sole Mfgs. of

INVINCIBLE NOZZLES

We invite figuring or bidding on all types of brass work

No. 156
"MORSE" SHUT-OFF NOZZLE AND PLAYPIPE COMBINATION

FIREBOAT TOWER NOZZLE

Operated by Remote Control

with full Transverse Control

Figure 114-B
— one of many — made by pioneers in nozzle manufacture.

AUTOMATIC-OPERATING SHUTTER AND SLIDING POLE

For the FINEST BRASS GOODS

Specify McINTIRE

15 feet high
6500 G.P.M.
5" tip.

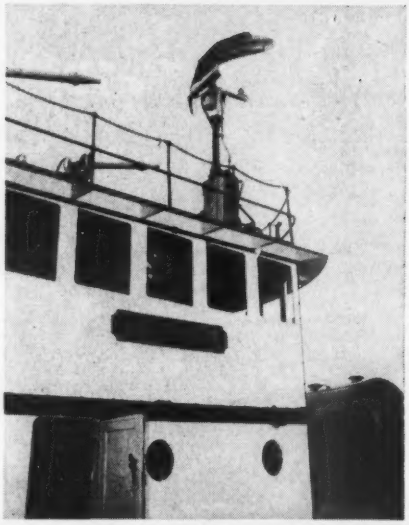
F. N. McINTIRE BRASS WORKS 377 Putnam Avenue Cambridge 39, Mass.

Decca Radar type 214 used by City Fire Departments

Here are just two typical installations

"Recently, the Firefighter (now Engine 223) was equipped with the latest type of radar, far superior to that carried by any vessel in the harbor. . . . The display unit (picture tube) has a maximum range of 10 miles and yet is able to define small objects within a few yards of the bow. In tests, small launches and even floating crates were tracked and plainly seen within a few yards of the Firefighter. In actual operation, the equipment will allow the Firefighter to operate in close to piers and ships under zero visibility conditions." *WNYF—OCT. 1955*

FIRE FIGHTER
NEW YORK CITY



Courtesy New York Fire Dept.

Through smoke, fog or darkness... Minimum operating range 30 feet from antenna!

L.A. CITY NO. 2
LOS ANGELES

Courtesy Los Angeles Fire Dept.

- Light weight easily mounted antenna.
- Compact units for simple installation and service.
- Fast scanning rate prevents picture fading.
- Fast action pivot mast eases low bridge problems.
- Backed by a sound service organization.

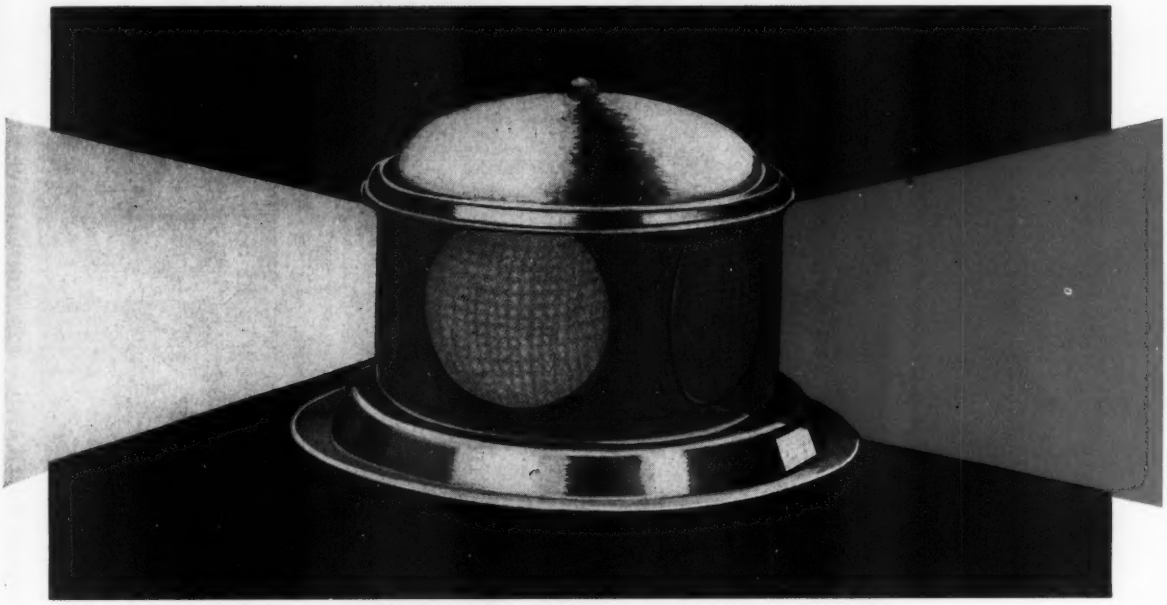
For complete brochure write to:

Decca Radar Inc.

539 West 25th Street, New York 1, N. Y. · ALgonquin 5-7420

"Buy Safety by Decca"

"CIRCLE BEAM"
Engineered to Demand Attention



NOW AVAILABLE IN TWO TYPES — BOTH HAVE THESE UNIQUE FEATURES

Shielded from the sun to increase daytime efficiency
Metal top provides against lens breakage
Designed for ease of service and inspection

MECHANICAL ROTATION
BEACON TYPE
Series 1006 and 1012

Units may be interchanged between 6 V or 12 V cars with minimum attention without replacing motors and without loss of efficiency.

Operating mechanism always instantly visible for service and inspection. The entire mechanism can be replaced in 10 minutes without removing the light from the roof.

NOW AVAILABLE Units only 7½" high, built to go through your present garage opening. Specify Type LH.

Speed adjustment to take care of line voltage drops.

ELECTRO-MAGNETIC PULSE TYPE
"Nothing moves but the beam"
Series 806 and 812

Synchronized flashing of a double beam of light gives an effect of rotation with protection forward to the sides and rear.

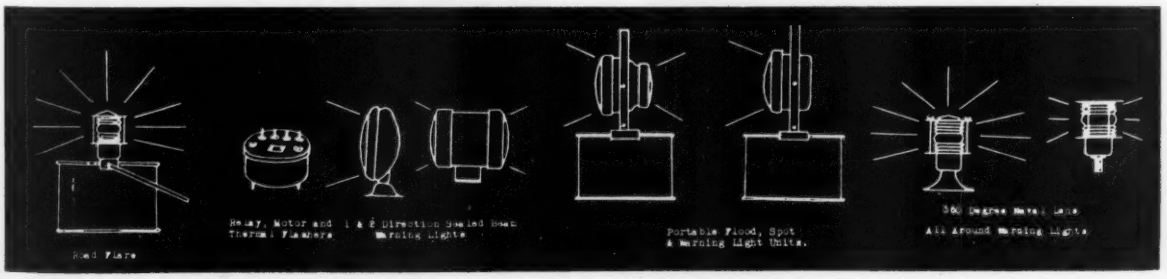
There is no motor to drive and practically all the energy goes into the lights. Flashing is obtained from the time-tested "MULTI-PULSE" TG high efficiency flashers. These lights are effective DAY and NIGHT. They use high-intensity sealed beam lamps easily replaced and have low battery drainage and negligible maintenance.

THE INDIVIDUAL FLASHES LAST LONG ENOUGH SO THAT A MOTORIST CAN ESTIMATE THE DISTANCE TO APPROACHING APPARATUS AND GET OUT OF THE WAY IN TIME. Available for flat roof, stanchion or adjustable slope roof mountings.

Ask for details on: "Circle Beam," Portable Work-Warning Lights, Vehicle Flashers or Traffic Blocking warning lights for scenes of accidents.

DESIGNED TO "SAVE LIVES WITH LIGHT"

JULIAN A. McDERMOTT CORP. 40-22 NATIONAL ST., CORONA 68, N. Y.


Road Flare
Rotary, Motor and Thermal Flashers
1 & 2 Direction Sealed Beam Warning Lights
Portable Flood, Spot & Warning Light Units.
360 Degree Revolving Lens All Around Warning Lights

散獻給朝鮮人民

These reels can be procured for any apparatus, or, even modernize your present truck with an H&H electric rewind reel.

America's hardest worked fire truck goes to Korea offering the same efficiency—maneuverability—construction—economy, as its predecessors at home.

This truck built by H&H Fire Apparatus is the most useful apparatus for city or rural service. Of excellent road performance—easily handled—small enough to be efficient in restricted conditions—large enough to be comprehensively equipped. This body can be installed on any commercial chassis as well as custom built. This triple combination pumper has a 500 GPM mid-ship pump—500 gallons of water with an integral 40 gallon foam tank. Full depth water tight compartments on both sides, with suction hose trough built in the body. An H&H Reel is mounted behind the cab.

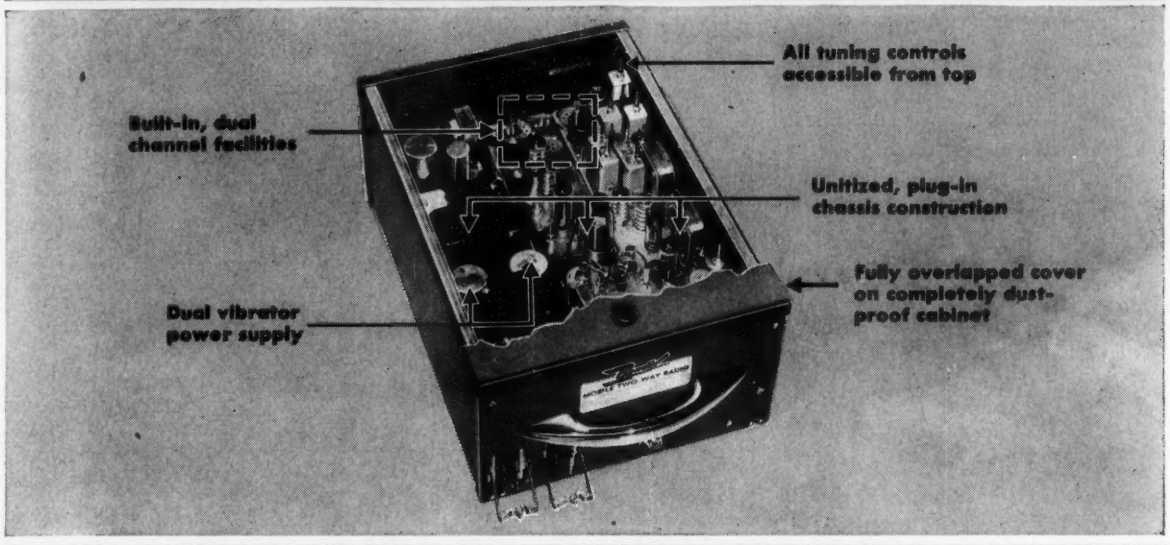
This pumper meets all N.B.F.U. specifications for class "A" pumpers.

Interested?? For information call or write—

H & H
FIRE APPARATUS CORP.
725 TONNELE AVE., JERSEY CITY, N. J.

IMITATED BUT NEVER DUPLICATED

IT'S HERE! THE BIG ADVANCE IN 2-WAY RADIO FOR FIRE FIGHTING


All tuning controls accessible from top
Built-in, dual channel facilities
Unitized, plug-in chassis construction
Fully overlapped cover on completely dust-proof cabinet
Dual vibrator power supply

Bendix DYNA-COM

ALL NEW! BRAND NEW! MOBILE UNITS AND BASE STATIONS

The result of over 5 years laboratory research and development, Bendix* Dyna-Com is *the first big advance* in 2-way radio in over a decade. All new from chassis to cabinet, each model incorporates all the latest improvements which have made Bendix the foremost leader in railroad and aviation communications; in airborne navigation; in radar and in military electronics.

For example, Dyna-Com's unitized design sets a new standard for performance and dependability. It features plug-in, interchangeable chassis construction which speeds service and saves maintenance costs. Any chassis in the Dyna-Com line can be transferred, without adjustment or modification, between mobile units and base stations.

Designed to meet the exacting requirements of fire-fighting duty; the Dyna-Com line covers all frequencies. High-powered models enable vehicles to maintain contact with headquarters and each other. The Bendix Bantam and Portable designed especially for low-power fire service—most versatile FM 2-way radios ever built—provide low cost, on-the-scene communications.

All units are fully enclosed in rugged, weather-resistant, steel cabinets. New desk console base stations permit remote vehicles to be contacted in minimum time. Operating controls are located on front panel, which includes loudspeaker, cyclotron clock and meter with a 17-position switch for instant, finger-tip monitoring of all circuits.

Get the full story on how Bendix Dyna-Com can boost the efficiency of your communications. Let a Bendix Communications Engineer survey your needs without obligation. Call or mail coupon today for full information on Dyna-Com—*the first big advance in 2-way radio!*

*Reg. U. S. Pat. Off.

Bendix Radio

DIVISION OF BENDIX AVIATION CORPORATION • BALTIMORE 4, MD.

Bendix Radio
Mobile Sales, Dept. N
Baltimore 4, Md.

Gentlemen:
Please send me complete details about Bendix Dyna-Com 2-Way Radio

☐ 25-54 mc. ☐ 450-470 mc.
☐ 144-174 mc. ☐ Bantam
☐ Portable

Name_____
Title_____
Address_____
City_____ State_____

IMITATED BUT NEVER DUPLICATED 725 TONNELE AVE., JERSEY CITY, N. J.
custom built. This triple combination pumper has a 500 GPM

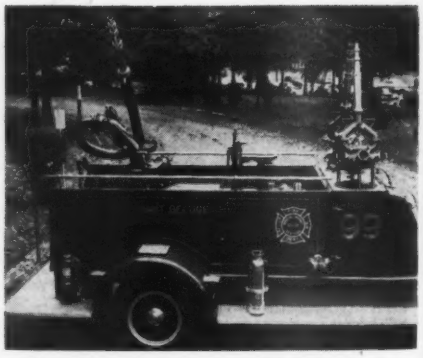
PHOTO COURTESY PHILADELPHIA FIRE DEPT.

Introducing–

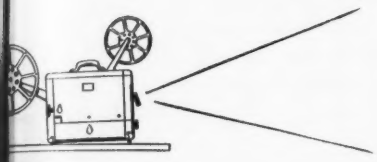
CHIKSAN Intelli-Giant...

THE NEW **BIG BERTHA** OF FIRE SUPPRESSION

Capable of delivering a quenching 2,500 gallon per minute deluge, this latest development in master stream fire fighting equipment has a dramatically effective striking range of better than 320 feet in distance, a far reaching 165 feet in height. Yet with all of its powerful striking force, one man seated at hydraulic controls has finger tip mastery of the Intelli-Giant at all times. Extremely versatile, the design of the Intelli-Giant makes it ideally suited for installation either on mobile equipment or as a fixed implacement in hazardous areas.

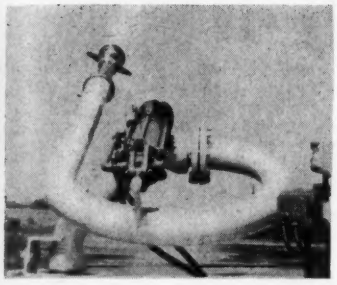


Dispatched to combat a roaring mill fire on an island in the Schuylkill River, this Intelli-Giant, owned by the Philadelphia Fire Department, reached areas where conventional monitors could not. It successfully prevented the raging inferno from engulfing 650 feet of the seven story building not yet affected by the fire.

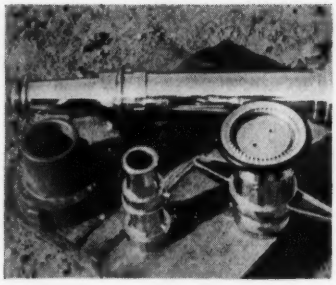


Be sure you see "Modern Firefighting"

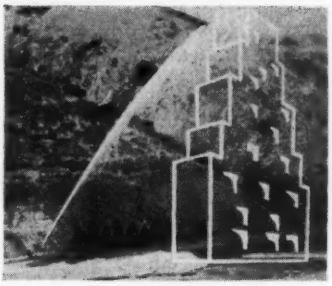
a highly informative movie now available on the latest development in master stream equipment. Write Chiksan, 336 Pomona Avenue, Brea, California, to arrange a showing



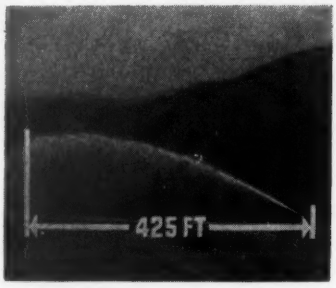
Patented barrel design provides single full diameter stream regardless of barrel position.



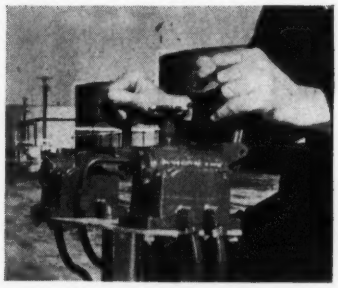
Any standard nozzle can be used from smaller sizes up to a 3-inch size, singly or in stacked tips.



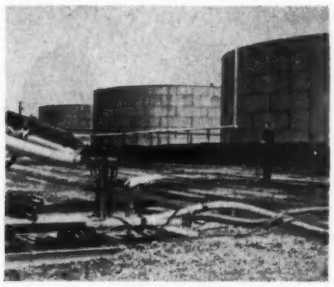
Elevated to 75°, the Intelli-Giant's stream reaches a height of 165 feet . . . enough to top a 12 story building.



At 30° elevation and with sufficient pressure, the Intelli-Giant delivers 2500 gpm a far reaching 425 feet.

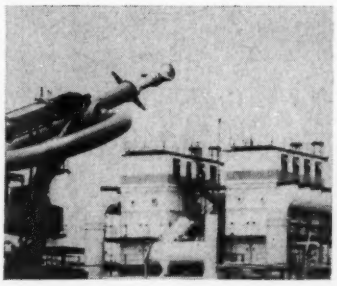


Motion of the barrel is controlled by two levers operating fourway valves.

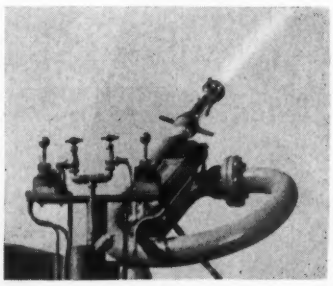


Remote controls permit Giant to be set in close to fire yet operated from a distant vantage point.

Even when operated manually, one man using one hand has complete control of stream direction.



Located as a fixed emplacement, in hazardous areas, the Intelli-Giant permits immediate action minutes after fire detection.



The Intelli-Giant, with its high volume output and simple controls costs less than monitors of comparable size.

CHIKSAN

fmc

A SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

CHIKSAN COMPANY–BREA, CALIFORNIA • CHICAGO 5, ILLINOIS • NEWARK 2, NEW JERSEY

Well Equipment Mfg. Corp. (Division), Houston 1, Texas • Subsidiaries: Chiksan Export Company • Chiksan of Canada, Ltd.

This dramatic report . . . in Chief Owen's own words . . . reveals why Fire Chiefs who have had experience with Audio Hailer, *urge other* Dept's to adopt them. With Hailer, you can *"make yourself HEARD"* . . . project your voice to individuals or groups . . . with the power and authority to cut through the racket. Audio Hailer is the *ONLY* electronic megaphone that contains a genuine vacuum-tube amplifier. It operates on self-contained, dry batteries—weighs only 5½ lbs.—yet amplifies speech 1000 times! Let Hailer speak for itself:—for full details, or field demonstration, use convenient coupon below.

Audio Equipment Co., Inc.
Great Neck, N. Y.

"Only through use of A
were we able to c

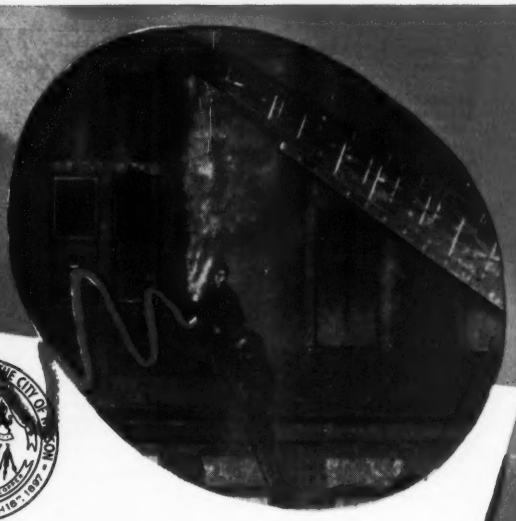
—ONE FIRE CHIEF TELLS

AUDIO HAILER®
PORTABLE, SELF-CONTAINED

CHIEF ELWIN S. OWENS,
City of Nelson, B. C., Fire Dept.

Audio Hailer "control panic"

ANOTHER...



City of Nelson, British Columbia

OFFICE OF
CHIEF OF FIRE DEPARTMENT

E. S. OWENS, CHIEF

Mr. William H. Short, Fire Chief
City of Lethbridge Fire Department
Lethbridge, Alberta

Good-day Mr. Short:

In reply to your inquiry, I most highly recommend Audio Hailer (megaphone) to all fire dept's.

Two months ago, I felt improvement to the signal system was necessary. I contacted Audio Equipment Co., who forwarded one self-contained, hand portable model (Hailer).

Exactly two days after the megaphone arrived, we incurred a large hotel fire in which we lost six lives. Upon arrival at the fire, men, women and children were hanging from the windows, screaming, etc. Only through the use of Audio Hailer, were we able to calm and control the panic, instructing the people to "hang-on" and not to move, as we would complete their rescue in time to save their lives, or serious injury. As a result 50-odd people were rescued without injury, and believe me, the injury list could have been large and serious. To give you an idea of how serious, one victim dropped just prior to our arrival, and received a broken back.

The above is not the egotism of a fire chief, but concrete facts. I can assure your department, you would more than be satisfied, if you include this versatile unit with your most up-to-date fire fighting equipment.

Very truly yours,

Elwin S. Owens

Background photos of Strathcona Hotel disaster, courtesy of Nelson Fire Dept.

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Bakersfield
Burbank
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Castro Valley
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Corning
Coronado
Daly City
El Centro
Emeryville
Eureka
Fresno
Lafayette
Los Angeles
Los Angeles County
Los Gatos
Martinez
Menlo Park
Merced
Monterey
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Napa
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San Francisco
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Santa Ana
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VOL. 109, NO. 10 FIRE ENGINEERING OCTOBER, 1956

PROGRESS—HOW FAR AND HOW FAST?

Progress is a relative term. One can progress forward —or backward.

As our readers can see, this IAFC Conference Issue is an accounting of progress in the fire service. Most of it, happily, is forward progress. But there is a bit of "view with alarm" also, for the self-complacent. The fact is, fire loss records are still written in red. The race between catastrophic losses of life and property on the one hand, and the efforts of the fire service to reverse present loss trends is a nip-and-tuck affair.

On the encouraging side of the ledger, we have more fire departments, public and private, than ever before, and scores are being added yearly. We have more specialists engaged in fire protection and prevention than ever in our history. Our mechanical and scientific facilities for detecting, reporting and extinguishing fire are improving in number and effectiveness. And we're glad to report our fire fighting personnel is working under better conditions, with fewer hours and better pay and more emoluments than ever in fire service history. Our fire fighting personnel, too, is better trained in firemanship, better prepared with fire fighting and life saving facilities to meet the increasing hazards of this chemical and atomic age. Lastly, our fire equipment industry is healthy and expanding—again witness this book.

Our methods and techniques of attacking, controlling and extinguishing fire are becoming more scientific, more efficient. Administration of our fire departments shows favorable improvement. This is reflected in the numerous long-term improvement and rehabilitation programs planned, and in process. All in all, we are building a better, harder striking, more professional fire service than has ever been known. All this is forward progress!

But on the debit side of the ledger, the regrettable fact remains that (1) we are having more plain and fancy fires—our fire forces are having more work to do; (2) we are having more life-taking, property-consuming fires, more large-loss conflagrations than ever in history, with annual loss of life of over 11,000 persons and property destruction now exceeding $1 billion.

And bear this disturbing fact in mind: These deadly, destructive losses are occurring in the face of the most widespread, energetic fire prevention efforts the nation has ever known. One is compelled to ask: What would these losses be had we not our present fire suppression forces?

No matter how we plan forward progress, budgetary limitations have a way of slowing it down. And no matter how we plan and prepare for it, disaster in one form or another—fire, flood, hurricane, explosion and the like—is just around the corner. No city is too big or too well organized and prepared for it.

Our very peak prosperity is furthering fire prevention and extinguishing problems of which yesterday's fire fighters never dreamed. And these problems are growing more complex and complicated with our economic, social and political progress.

What can be done about it? Well, the first thing is cooperation. The fire service is made up of many bodies, branches and diversified interests. There must be teamwork if we are to accelerate forward progress. There must be joint planning, joint endeavor all along the line. Professional, full-paid municipal, private and volunteer fire fighters; signalmen; fire engineers; Underwriters and rating boards, yes even the buffs, must band together as never before in the common dedicated cause—fire safety for every walk of life, in branches of government, in home, office, factory and farm.

We must continue to strive for better, more effective fire prevention laws, for enforcement of existing statutes and we must support those fire services and related organizations that stand for those laws. We must continue to raise fire department and fire suppression standards in facilities and in their use, and we must continue to improve the standing and the stature of our fire fighters.

Only by so doing, will forward progress continue to be recognized.

Roi B. Woolley

Editor

The fire which destroyed this plant of the General Motors Co. at Livonia, Mich., in 1953, with losses exceeding $25 million, taught the fallacy of large unstopped areas, lack of full sprinkler coverage and inadequate plant and public fire protection. The question is: Has industry learned the lesson?

Fire Service Progress — Prospect and Retrospect

The fire service has come a long way in the last fifty years—and it has a long way to go. Where is it headed and how fast is it going?

By FRED SHEPPERD
Editorial Director, FIRE ENGINEERING

IT REQUIRES TWO POINTS to determine the direction of a straight line. Thus if we are to visualize the direction the fire service of the nation is headed, it is necessary to make an appraisal of the past and review its status as of today. From these two, the future of the service may be projected.

The first of the two "points" to be considered will be at the turn of the century; the second, 1956. Thus the trend during a half century will point the way for development expected in the future.

Fifty years ago

At the turn of the century there were no industrial plants of vast area as there are today. The assembly line method of manufacturing, requiring large, unobstructed floor space, had not come into being. With but few exceptions industrial plants were of relatively moderate size.

There were comparatively few flammable liquids such as found today in most industries. Coal oil (kerosene), alcohol and a relatively small production of gasoline constituted the bulk of these common flammables. There were no huge refineries, tank farms or gasoline distributing centers, and correspondingly limited transportation hazards.

There were, of course, some flammable solvents, lacquers and thinners on the market, but in small supply.

Building construction, in general, presented few hazards to the fire service.

Fire fighting equipment then available was adequate to control all ordinary fires.

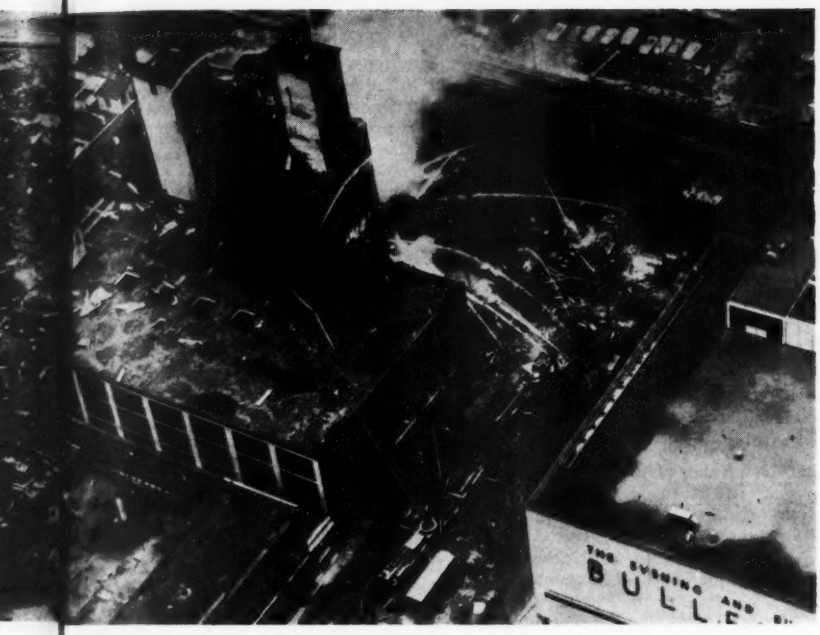
Water was practically the only extinguishing agent. Steam fire engines, hose wagons, ladder trucks, water towers and soda and acid chemical engines, all horse-drawn, constituted the equipment commonly employed by the average city fire department.

Fire department communication facilities were confined to fire alarm telegraph systems, and there were few of these, for only in the larger cities were they commonly found.

Personnel of fire departments at that time were on continuous duty, with a 24-hour work day and with but one day off in four, five or six.

Appointments were politically made, and a change in political control of a city frequently meant a major change in department personnel. In many cities firemen had to work for re-election of current political incumbents to insure their jobs.

There were practically no educational requirements for entrance into a fire department. It was at that time that an officer of an eastern fire department facetiously remarked, "The man who makes the best fireman is one with a strong back and weak mind."



Explosive fires of unexplained origin are increasing. A blast followed by fire on March 28, 1956, wrecked many buildings in Philadelphia with heavy damage and loss of life. Only efficient work by the Philadelphia Fire Department prevented a holocaust

The pay of firemen was low, relatively farther below that of skilled workmen than it is today. And there were few pensions and practically no fringe benefits.

As indicated above, there was no protection of the job, for civil service examinations for entrance and promotion in a department were practically unknown.

Living conditions in fire stations were necessarily poor, for the horses were kept in the station with the men.

Hazards multiply in half-century

With the industrial advance of this nation during the past half-century have come fire hazards in number and size that stagger the imagination.

One development alone—the introduction of the automobile—has created more and greater fire hazards than existed at the turn of the century.

Refineries, tank farms, service stations, garages and transportation of gasoline and other petroleum products are all part of this development.

Then there are a multitude of other commonly employed liquids—over 300—which today add to the burden of the fire service. Among these are such highly volatile flammables as acetone, carbon disulphide, butadiene and many types of alcohol.

Other dangerous chemicals such as the chlorates, nitrates and peroxides, all of which are oxidizing agents and intensify a fire, have come into wide usage. So have hydrocyanic, nitric, sulphuric and nitric acids.

Even in the field of metals, which have commonly been considered as incombustible, there have appeared some which are extremely dangerous, especially when in powdered form. Dust clouds of uranium, uranium hydride and zirconium may ignite at room temperature immediately upon dispersion in the air. Others, such as magnesium and aluminum, may ignite when a source of ignition is provided. Thus such metallic dust clouds in air constitute a severe explosion hazard.

Industrial processes, brought about by the amazing advance in chemical research, have added a myriad of hazards which today's fire fighters must face. These hazards may involve explosion, fire or personnel injury. Toxic gases from chemical processes, or produced by fire involving them, create a major danger to firemen today.

The danger of explosion in a plant in which complex chemical processes are carried out is a constant threat to those who must work close at hand in controlling fire therein, as well as to the working force of the plant.

Lack of full knowledge of the characteristics and potentialities of a chemical process or product, particularly one of recent development, may result in catastrophe.

The Texas City disaster was directly chargeable to ignorance of what ammonium nitrate might do when involved by fire under certain conditions. Explosions involving molten salts being used as heating mediums in the heat treatment of various metals and alloys were fairly common until the process was thoroughly understood.

The disastrous Cleveland gas tank explosion resulted from insufficient knowledge of the process employed and the hazards entailed.

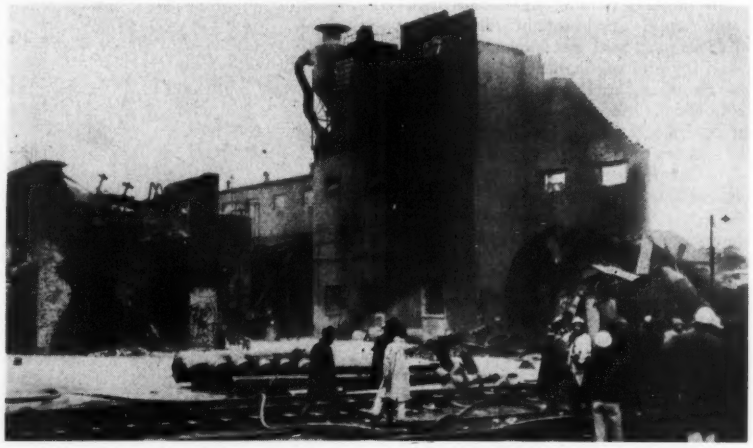
Many other potentially hazardous processes and materials have marked the advance of this country industrially. Some of these are: Synthetic and natural rubber processing, plastics, LP gas bulk storage, and natural gas transmission and distribution.

And in addition, we have the growing hazards incidental to the rapidly developing aviation industry.

Finally, the use of atomic power and the growing field of radioactive materials will pose new problems for those who may be called in to extinguish fires involving generating stations or radioactive materials in storage or transit.

Modern buildings introduce hazards

In the matter of building construction, both industrial and mercantile, the changes over the past half-century have been revolutionary. Today, industrial plants of vast area, possessing no lateral fire stops, are common. Many of these plants, particularly in the metalworking industries, are literally oil-soaked. Absence of firebreaks, or fire walls, is the result of use of assembly line operations. Introduced first in motor car plants, assembly line production, especially where the plant is all on one floor, has grown



Vast developments in the chemical industry are increasing fire and explosion hazards. An example is the blast followed by fire which wrecked chemical buildings of the Seneca Division, United Refining Co. at Warren, Pa., October 30, 1955, with damage estimated at over $500,000

in application until today most mass-produced articles involve the use of assembly lines.

Many modern industrial buildings are of such vast area that should a fire occur near the center of the structure, it would be beyond the reach of fire streams operated from outside the building. Such was the experience at the big Livonia, Mich., General Motors transmission plant fire, where the loss was in excess of $25 million.

To make matters worse, means of ventilating such structures in the event of fires are frequently not provided.

Industrial plants today account for the largest fires, and for the major part of the nation's fire loss. An analysis of fire loss figures of the National Board of Fire Underwriters, over a period of ten years, indicates that one-third of 1 per cent of the fires are responsible for over 60 per cent of the losses, and that these are primarily industrial in character.

Another innovation in building design today which will add to the difficulties of fire fighters is the completely enclosed, air-conditioned, artificially illuminated structure. Air ducts tend to spread smoke throughout the structure, while the absence of windows makes the locating and fighting of the fire particularly difficult. And unless the air conditioning system is properly designed and ducts provided with effective cut-offs, there is a likelihood of these ducts actually spreading the fire throughout the building.

The fire service keeps pace

During the past five decades of industrial advance, and within which were created fire hazards appalling in number and severity, the fire service has managed to keep pace with the responsibilities placed upon it.

When better pumping apparatus was needed, it was forthcoming—when better ladder equipment was needed, it was provided.

And where fire extinguishing agents, other than water, were required to control extraordinary fires, they too were developed.

The growing number and size of flammable liquid fires brought forth foam, both chemical and mechanical; then followed fog and fog-foam. Carbon dioxide, too, found an application, both in hand extinguishers and in installed systems, for controlling flammable liquid fires, as did also dry chemical.

For small fires of this type, carbon tetrachloride, chlorobromomethane, "loaded stream" extinguishers, methyl bromide, dry chemical and carbon dioxide proved effective.

Water fog, though nothing more than plain water in finely divided form, is daily finding new applications in fire control.

The introduction of wetting agents into water employed to extinguish fire has proved effective in increasing the penetrativeness of the water. The wetting agent enables water to readily enter materials which would shed plain water. Also, "wet water" fog is effective in extinguishing certain petroleum products fires, as well as providing a heat insulating coating to protect exposures.

When magnesium became available in quantity following World War II, the fire service was suddenly faced with the problem of controlling fires involving this metal. Magnesium fires could not be controlled by any of the common fire extinguishing agents. The fire equipment field went quickly to work, and came up with effective agents for this particular task.

Thus for each new fire hazard, as it appeared, the fire service has been given an effective extinguishing agent. Hence the service has been able technically to meet each new problem as it arose.

Fire department personnel marks gains

But the advance of the fire service was not alone a technical advance. Improvement in personnel outstripped that in fire fighting equipment and methods.

The adoption of civil service examinations for entrance into, and promotion in, the fire service practically eliminated politics in fire departments. It encouraged men to study for advancement.

Where fire department schools were established, the men had an incentive to attend and to master the subjects presented.

Reduction in working hours from the old system of continuous service to, in some cases, as little as 40 hours per week, and the gradual increase in scale of pay as well as providing pension systems, have attracted a higher class of rookies. Today, while many fire departments require candidates to have a high school education or the equivalent, a great number of those entering the service hold college degrees.

Because of the complexity of fire hazards encountered today by fire fighters, as well as the big variety of fire control media in use, there is real need for these better trained men. Where a fireman has a dozen effective extinguishing agents to work with instead of one, and where many types of fires require a specific type of extinguishing medium, it is apparent that the fireman must be thoroughly informed on the use of those agents and be able to determine on which fires the use of certain extinguishers is indicated.

The qualified fireman of today must have a general knowledge of chemicals and chemical processes, industrial processes, building construction, hydraulics and electricity, and a more complete knowledge of fire apparatus, fire extinguishing agents, salvage and laws and ordinances and rules and regulations, as they affect the fire service.

It must thus be concluded that the improvement in personnel of the fire service has more than kept pace with the advance in fire apparatus, equipment and extinguishing media.

Today, the fire service is a profession rather than just a job. And it is highly encouraging that the public in general is beginning to recognize this fact.

The future

The amazingly rapid industrial advance of this country may be expected to continue, and at an ever accelerated rate. The creation of each new product, or process, opens the door for a whole series of new developments.

The advance may be expected to bring forth hazards of greater complexity and greater potentialities of destruction. New manufacturing processes involving excessively high pressures and temperatures, and involving materials of unknown characteristics may be expected to augment the dangers to be encountered by fire fighting forces.

Research is continually bringing forth processes and materials, some of which are fraught with terrible potentialities. New synthetic products so developed may present fire and explosion possibilities undreamed of today.

The ignition of vapors from ruptured tanks of the East Ohio Gas Co., Cleveland, Ohio, containing liquefied natural gas, on October 20, 1944, killed 133 persons, injured many more, caused property damage of over $6 million and resulted in the revision of many fire prevention and building codes and zoning laws

To further augment the difficulties to be faced by the fire service, still larger industrial plants, equipped with more massive, costlier machinery may be expected.

How are we going to handle these formidable problems?

Of all big businesses, the fire service does the least in the way of research. While a few independent organizations, such as the National Bureau of Standards and the Engineer Research and Development Laboratories of the Army, have done a limited amount of work on extinguishing agents, practically nothing has been done on the phenomena of fire and its extinguishment. That there is an amazing lack of information on the basic effects of fire extinguishing mediums, and how they bring about the extinguishment of fire, is well illustrated by the case of dry chemical. No one knows for certain how this effective agent produces its results. Evidence indicates that it is not by the release of carbon dioxide gas from the sodium bicarbonate, nor is it brought about by smothering or cooling. The same situation exists in the case of certain other chemical extinguishers.

Thus here's fertile ground for pure research which should produce a healthy crop of valuable information for those concerned with fire control.

There is also plenty of ground for research on fog, and particularly in the phenomena of indirect application. Also, the size of fog droplets for most effective extinguishing effect is a subject worthy of extensive research.

With foam, too, there is still room for research. For example, what are the potentials of foam in covering exposures?

Several new chemical extinguishers have been investigated and tested at the Engineer Research and Development Laboratories at Fort Belvoir, Va. Some show real promise from standpoints of both effectiveness and lack of toxicity. Here again is opportunity for some real research.

Research in methods of controlling large fires of different types offers possibilities. In each type, basic operations are similar. Through research it may be possible to set up basic procedures for each type, and thus make available to fire departments information which will be invaluable in the event the "big one" does occur. Such research would include the type of extinguishing agent best suited for the task, as well as listing unusual hazards which might be encountered.

In the over-all effort to reduce fire loss, the most important step is to prevent fire from starting; next in importance is the automatic detection and extinguishing of fire, particularly where it is of fast-spreading nature; finally, reducing the time between start of fire and its discovery—and transmission of alarm.

Of the three, the last-named has the greatest impact on the fire service. When fire starts and gets out of hand, its control then becomes the sole responsibility of the fire department.

As stated previously, over 60 per cent of the fire losses of the nation are made up by one-third of one per cent of the fires. Thus it is up to the fire service to make the greatest cut in losses by checking fires before they become large.

Automatic detection and extinguishment

Automatic detection of fire and transmission of alarms have made major advances in the past few years. But there still remains a lot to be done. Electronic developments have speeded up the spotting of a fire, but automatic transmission of alarms lags in that still too many properties have not the facilities therefor available. The time may come when all major buildings in a city are equipped with automatic alarm systems which are directly or indirectly connected to the fire alarm headquarters. When such time arrives, there should be a marked reduction in the number of larger fires.

Progress in the automatic extinguishment of fire is being maintained, all proven extinguishing agents contributing to the over-all picture.

The widening application of foam, carbon dioxide, dry chemical and water spray for special hazards is indicated. Other agents, particularly chemical, are finding increased usage, especially in guarding against smaller hazards.

Not many major changes are anticipated in municipal fire fighting apparatus and equipment in the next few years. Present fire apparatus has the necessary power and pump capacity to meet all current needs. The future, however, may hold one revolutionary change in fire apparatus power plants: Great studies are being made in perfecting turbojet engines, and it may not be many years before these find their way into fire apparatus. Delivering approximately one horsepower for each pound of weight, their adoption would make available additional load capacity of a fire truck. Incidentally, the rapidly growing use of turbo engines on commercial aircraft, where weight reduction is such an important factor, is evidence of their advanced state of development.

If large industrial plant fires are to be avoided in the future, certain safeguards must be incorporated in structural design. Fire resistive construction must include roof and flooring as well as walls. Excessively large floor areas must be subdivided by fire walls. No part of floor area should be beyond the reach of fire streams directed from doorways or windows. Provision should be made for prompt venting to facilitate fire control operations. The General Motors fire at Livonia, Mich., well illustrated the soundness of these suggestions.

Training of personnel

Over the past decade great progress has been made in training fire department personnel. State, county and municipal fire schools have done an outstanding job in bringing training to the rank and file as well as to officers in both paid and volunteer departments. But much still remains to be done.

New products, new processes are continually being developed by industry, and many introduce new fire and life hazards. Thus training of personnel must be a continuous activity.

Most fire schools fail to train the student in actual fire fighting.

A mechanic working in a machine shop gets in the neighborhood of 40 hours of experience a week or 2,000 hours a year. A fireman in a busy fire company, working under the two-platoon system would, on the average, get less than 100 hours a year of fire fighting experience. And yet he is expected to become thoroughly proficient within a couple of years.

If efficient fire fighters are to be developed in fire schools, these schools must also include "learning by doing"—actual fire fighting.

Continued on page 976

Nineteen fire fighters, seven of them members of the Dumas, Tex., Volunteer Fire Department and eight from the Sun Ray Fire Department, with four plant firemen, were killed July 29, 1956, when a small fire ignited vapors from a ruptured tank containing pentane and hexane. Thirty other men were injured

Briefing by officer before men start calls is one step in Los Angeles County field radio home inspection program—*L. A. County F. D. photo*

Following briefing, men start inspections while driver remains in apparatus to monitor radio. Note trim uniform—*L. A. County F. D. photo*

HOME FIRE INSPECTIONS . . .

Past, Present, — and Future

Will fire company field inspection reduce the heavy losses with their high fatality incident—particularly among children? This study, by the Editors of FIRE ENGINEERING, would seem to prove it will.*

IT IS APPROPRIATE that the continuing theme for this year's Fire Prevention Week (October 7-12) should be "Children and Fire Safety."

Of the 11,500 persons who die needlessly by fire each year in this country, it is said the very young and very old predominate. The precise figures are not known. But it is conservatively estimated that fully 4,000 children are victims of fire, while several times that number suffer injury, many of them, permanent disfigurement.

The statisticians tell us that there are an average of 1200 home fires every day and that these fires claim more child victims than any other kind.

Every experienced fire fighter, whether he agrees with these statistics or not, will admit that this needless killing of young people offers about the greatest opportunity for practicing sound, energetic fire prevention that a willing fire service could hope for.

Therefore, if it is desired to effectuate the 1956 Fire Prevention Week slogan "Don't Give Fire a Place to Start," the place to begin is in the home. It is as simple as that: If we can prevent the occurrence of fire in the place where most fires start (1,200 of them every day), and where most fire casualties occur—the home—we will have preserved lives and property.

It is difficult to find fault with this reasoning. But it isn't difficult to find the most logical means to prevent these fires from starting. The answer is to have a continuing home fire safety inspection program.

This conclusion is no surprise to most veteran fire fighters. They have long known that carelessness, like charity, begins in the home. They have known that intelligent fire prevention also must begin in the home, with the householder, and his family—particularly his children. But regrettably enough, with but a few glaring exceptions, fire fighters have been content to bask in the shadow of that (hoary) old catchphrase "every man's home is his castle," and practice a strict 'hands off' policy, insofar as it concerned inspection of private dwellings. Thus we have seen inspections of living places largely centered on multiple dwellings, tenements and places of assembly where the fire inspector had legal as well as moral right to inspect, locate and correct real or potential fire causes.

Some had vision

We mentioned exceptions. There were a few stalwarts who were not dismayed by slogans or laws written and unwritten about the sanctity of the home. One of these was the late Chief Daniel B. Tierney, of Arlington, Mass., one-time president, and for many years secretary-treasurer of the International Association of Fire Chiefs.

Chief Tierney was long aware of home hazards and home casualties caused by fire. He determined to do something about it. And he did. He believed that

* This report is dedicated, with grateful acknowledgment of his assistance, to Jay W. Stevens, who, more than any other living student of fire prevention, has awakened the public consciousness of the senseless slaughter by fire of over 4,000 young people annually in this nation. Thanks are expressed also, for the assistance rendered the editors by fire chiefs, fire service organizations and others, too numerous to mention in the preparation of this study.

Los Angeles County fireman calling on housewife to ask cooperation during dwelling inspection campaign—*L. A. County F. D. photo*

Backyard hazard explained to housewife by L. A. County fireman during home fire prevention inspection drive—*L. A. County F. D. photo*

the place to start was the residence basement where in his days, the majority of house fires originated. He believed that with the proper approach and appeal, the average householder would welcome the inspection of his basement or, if he wouldn't exactly welcome it, he would permit it, when done courteously and intelligently by uniformed firemen.

Chief Tierney may not have been the first in the nation, but he was the pioneer in New England, to institute the first home inspection program. That was over 30 years ago, a practice which we are told has continued in his city to this day. Year after year, the annual reports of the Arlington Fire Department have contained such passages as these (from the year 1943):

"For the twentieth consecutive year, firemen inspected the cellars of every residence in town. Only six fires occurred in residential cellars as compared with 7 in 1942, 8 in 1941, 10 in 1940, and 11 in 1939."

Providence goes further

The example set by Chief Tierney in Arlington was followed by a few other progressive chiefs in New England and elsewhere. One of these was Chief Frank Charlesworth, of Providence, R. I. In November 1932, FIRE ENGINEERING told the story of the unique success accomplished in that city.

In 1930 Chief Charlesworth's department conducted a six week's inspection drive, in which 77,077 dwellings were visited. Admittance was refused at only 231 homes. During the campaign the city incinerator handled 35 extra tons of rubbish daily. It took in 3,500 old Christmas trees, although the inspection was made eight months after Christmas. Thirty-eight hundred old mattresses also were sent to the incinerator.

Chief Charlesworth's men, like Arlington firemen, confined themselves to basements. The firemen volunteered their services, working on off-time. Before the drive started, the Chief talked with and secured the cooperation of local newspaper editors, which daily carried stories, cartoons and news about the enterprise.

Firemen wore full uniform and called in pairs. They asked permission of the housewife to inspect the basement and requested her to accompany them, calling her attention to the defects and hazards. Two pamphlets were left with the housewife, calling attention to other parts of the house and hazards which might be found therein. These are all sound inspection practices still being followed today.

From the early start, Providence has variously maintained its inspection programs. Chief Lewis A. Marshall, when he took over, instituted radio apparatus inspections which have received wide publicity and have proved very successful.

Even before these New England departments were pioneering home inspections to strike at the root of most dwelling fires, the City of Portland, Oregon, was completing almost a decade of such preventive work.

Portland and Stevens pioneer

The moving spirit in this enterprise, and the man who has preached and practiced inspections to prevent fires was, and still is, Jay W. Stevens now executive secretary of the International Association of Fire Chiefs.

Away back in 1914, Jay, then Fire Marshal of Portland, began sending men between meal hours to make home inspections. This was done under the directions of Captain Edward Grenfell, now head of the city's fire department, who, incidentally, has continued the fire department inspection program, with some trimmings of his own, almost ever since. The Portland Fire Department will always remember Jay Stevens as a former battalion chief, but posterity will acclaim him as the exponent and torch-bearer of home inspections.

Suffice to say that as the original Portland program developed, the city's fire losses were cut 80 per cent in four years —no mean accomplishment in those days.

So much for early history. But notwithstanding these shining examples, the idea of firemen carrying fire prevention into the places where people lived was slow to germinate. This concept of fire prevention itself limped along for many years, wrestling with the wooden shingle, and what seemed other and more serious prevention problems. And so homes remained closed to fire fighters—until fire struck and then the smokeaters were more than welcome (if the householders were alive to do the honors).

Following the years of spasmodic efforts to find and correct home fire hazards, it remained for Fire Chief John H. Alderson, then head of the Los Angeles City Fire Department, to get the home inspection plan "on the road."

Almost his first act after his election to presidency of the I.A.F.C. in 1950, was to call upon Jay Stevens and inform him that he was appointing him chairman of a fire prevention committee, with full power to act. Chief Alderson not only pledged his full support, he gave it.

President Hoover heads group

Thus came into being the first truly nationwide plan whose primary aim was to save the lives of 4,000 or more children and prevent hideous injury to countless thousands of others, through home education and visitation. A formidable committee of nationally prominent persons was formed representing leading civic, commercial, fraternal, labor, church and other organizations, with no less a person than former President Herbert Hoover as its head.

A personal letter from Chairman Alderson went to some 17,000 fire chiefs urging their active participation. A prime object of the drive was to have every one of the 50 or more million homes in the nation visited by uniformed firemen, who would personally point out the hazards which were taking an increasing toll of lives and property.

The plan, with only a modicum of

As part of Minnesota statewide fire prevention conference, Governor Orville Freeman inspects building after helping extinguish fire purposely set to demonstrate latest fire fighting methods. Statewide drive was sponsored by American Hardware Mutual Insurance Co.

William Raney sadly stares at ruins of his home near New Ashford, Mass., following fire in which his son died in a futile effort to save a sister who had escaped. Raney's wife was badly burned

The Nation's "Save Lives by Inspection" campaign has taken many forms. In Memphis, Tenn., this effort was directed toward protecting unattended children and eliminating the hazardous kerosene heater. Here firemen carry the fire prevention gospel into a little home with a big brood—*Photo courtesy Memphis Fire Department*

financial support, nevertheless took root and inspired many a local campaign. It received further impetus as enterprising fire chiefs saw a fertile field for the broader use of their fire service mobile radio through company field inspections. Still, it was necessary to create—and recreate enthusiasm for such effort. This the I.A.F.C. attempted to do, with the welcome aid of the National Board of Fire Underwriters, the National Fire Protection Association, International Association of Fire Fighters and other cooperating agencies.

The program received new inspiration and impetus when the idea took hold with the states, and statewide fire prevention with emphasis on home inspections, received the blessing of state and civic leaders. Here, as in the case of President Hoover, another prominent figure added his effort to the cause. He was Governor Arthur B. Langlie of the State of Washington, a longtime friend of firemen of his state, who at the time was chairman of the Governors Conference of the United States.

At the suggestion of the Committee, Governor Langlie wrote all the other 47 governors, urging them to call a statewide fire prevention conference to be attended by all fire chiefs, fire marshals, and other officers, civic and other interested officials.

The response to Governor Langlie's letter was unanimous and in practically every case the state head expressed his willingness to cooperate fully.

Governors' Conferences multiply

Eighteen of these Governor's Conferences have already been held and more are planned or are in the making. All of those meetings have been eminently successful. These are primarily fire service conferences; invitations have thus far been limited to chief fire officers and fire marshals because these officials are charged with the main responsibility for any fire prevention effort and are the key men in this life-saving crusade. The Conference is the meeting ground to provide exchange of ideas as to how best to proceed with the program.

Briefly, the meetings called by the governors, are one-day affairs, usually held in the legislative chambers of the capitol buildings. The governor welcomes the group, expresses his interest, and pledges support of his office. Nationally-known speakers in the fire prevention circles stress the urgent need of the drive, after which the details of the program are unfolded. These fall within three categories:

(1) How to prepare the public to receive the firemen inspectors (This is very important and must be thoroughly done)

(2) How to school the firemen themselves for the particular tasks (Home inspections call for, good judgement and the exercise of tact)

(3) How to carry out the actual inspection program in the homes.

In several parts of the country, fire marshals have organized and are supervising statewide home inspection campaigns. This is true in Nebraska and Oregon, where, in the latter state, Fire Marshal Taylor has assigned a deputy to

devote his full time to assisting local fire departments in promoting their campaign.

The intense interest of the governors has been stimulating. Governor J. Hugo Aronson of Montana said in his welcoming address that if, as a result of his having called the meeting, one life might be saved, or even if he could prevent the destruction of a single home, the meeting was worth while. In Georgia, Governor S. Marvin Griffin was equally encouraging. Governor Langlie has said that the losses in his state last year were a direct challenge to the fire departments of the state. And in his closing remarks, Fire Chief Mitchell Doumit, who acted as chairman of the Washington state conference, said on behalf of firemen of his state: "I accept the challenge, and we are going out to do something about it." Still another governor pledged continuing cooperation and Milward L. Simpson of Wyoming asked that the conference be repeated next year.

Proof of the pudding

One of the difficulties encountered in such fire prevention efforts is the lack of positive evidence of accomplishments realized through efforts expended. Happily, the history of the home inspection movement has proved otherwise. The proof is found in the cold, hard statistics of fires and life and property losses. Nor are the results confined solely to the larger full-paid departments. It can now be said without fear of contradiction that even the small volunteer departments can conduct successful home inspections. A notable example is Kentville, N. S. (pop. 5,000), whose fire chief is Beverly R. Wade.

For the past several years the fire department has annually inspected every dwelling for fire hazards. Chief Wade reports that since 1945 no person has been killed or injured by fire. "Practically all citizens have become conscious of the danger of fire" he says.

Another small community is Ponca, Neb. State Fire Marshal E. C. Iverson went to Ponca and talked to firemen, the Commercial Club and the editor of the newspaper. The whole town endorsed the idea. The weekly church bulletin carried this notice: "The home-to-home hazard inspection will start Tuesday, September 11. Cooperate!" Inspections were made between 6:30 p.m. and 9:00 p.m. using two pieces of apparatus and ten men. Only on two occasions were firemen refused admittance. Fire Marshal Iverson says: "Any volunteer department can do what Ponca firemen did. All they need to do is to tell the citizens what they want, and they will go all the way with them."

Space does not permit recountal of all the progress made but we can mention a few of the more outstanding achievements, beginning with the nation's largest city, and fire department, New York.

Fire Commissioner Edward F. Cavanagh Jr., reports, "Our apparatus field inspection not only has turned up many hundreds of thousands of hazards, but has resulted in early correction of all these hazards and the prevention of their repetition. As a by-product, it has been one of the strongest mediums of education and fire safety propaganda that we could have devised.

"The pay-off is on the results. Fire statistics have been going up in this city for more than three decades to the point where in 1953 they reached approximately 56,000 in number. If we had made no effort to stem the rise, it is safe to say that at the end of the year 1956 we would have had . . . a total of about 62,000 fires. Building inspection, or home inspection . . . carried out by men and apparatus and radio contact with fire headquarters has even at this time brought a reduction from the actual high figure to a new low figure of about 46,000 fires, and I am more than confident that at the end of the year instead of what would have been 62,000 fires we will have a further reduction to approximately 42,000 fires for the year 1956."

In New York, the radio apparatus dwelling inspection program has taken several different approaches, one being the all-out effort to reduce the loss of life from oil stove fires (many of the casualties being children). As in the case of Memphis and other cities where home inspections and education have paid out, New York drastically reduced its fatalities from this source.

In Greater New York the over-all home inspection program based upon company radio inspections, has been broadened from the initial "pilot" effort, to cover all boroughs. And it has gone further. It has spurred fire department inspections in other fields and occupancies—business, industrial, etc. Now, even the department's powerful marine fleet's eight fireboats are "hitting the seaways," conducting waterfront inspections.

In Billings, Montana, the number of actual dwelling fires has been reduced by more than one half. Fire Chief Morse, while naturally pleased with this result, is more elated over the fact that they have saved the lives of at least ten children.

How does he know? Six years ago, the year before house-to-house inspections were started, three children were burned to death in his city. The year the program was launched, three more died. But in the four years since total inspections has been practiced, not one life has been lost.

In Los Angeles County, which includes the cities of Los Angeles, Long Beach, Beverly Hills, Pasadena, Burbank, Glendale, and twenty-three other municipalities, as well as many unincorporated communities, *90 per cent of the residences have been inspected.* And there is a marked reduction in fire losses, number of fires, and above all of death by fire, according to Jay Stevens.

One might contrast this with the experience of one city which shall be nameless but which has not adopted the "in-service" house-to-house inspection plan. Here is the statistical evidence:

Population increase since 1925 . . . . 570,000 to 790,000—or 33⅓%

Increase in number of alarms, same period . . . . 5,600 to 10,800—or 98%

Increase in number of actual fires (the only real measuring stick) . . . . 3,500 to 6,000—or 90%

Inspections have other values

Although the prime object of dwelling inspections is to reduce fire causes in the home, thereby preventing fires and attendant casualties and property destruction, home inspections as practiced today have another and important objective. That is the creation of public good will, and better relations between Mr. and Mrs. John Q. Public, and their fire department. And if good public relations are not an asset, ask any fire chief who has seen his proposed fire budget voted down by people "who just didn't seem to appreciate the fire department."

Take the city of Fresno, Calif. for example. Three years ago the fire department did an outstanding job of home inspections. Shortly after completion of the canvas, a sizeable bond issue for improvement of the fire department came before the people together with a similar bond issue for improving the police department. Net result: The fire bonds carried four to one; the police bonds failed.

It is common knowledge that the public is becoming more and more tax-conscious as municipal costs increase, which means, all public services are coming in for more and more scrutiny. Which indicates in turn, that the fire service as well as other public agencies, today must show that for the increased cost, the citizens are getting more and better service. Obviously, any element which creates more favorable acceptance of, and appreciation for the fire department is worth striving for.

Final proof—if any further is needed—of the efficacy of the home inspection program is found in the words of leaders who speak with the voice of authority. Listen to what some of them say:

Fire Chief William Fitzgerald, President, International Association of Fire Chiefs: "This is a grass roots campaign, one that must be carried out on the local level by uniformed firemen. It is our duty, our responsibility. If the job is done according to the plan and if competent, complete inspection is made, it just can't miss."

John A. Neale, President, National Fire Protection Association and Chief Engineer, National Board of Fire Underwriters: "The home inspection program sponsored by the International Association of Fire Chiefs and performed by municipal fire departments, is one of the most outstanding and worth-while fire prevention efforts currently being performed. Reports reaching us show that in cities where the program is being carried out, it has resulted in a significant reduction in the number of fires.

Richard E. Vernor, Manager Fire Prevention Department, Western Actuarial Bureau, Chairman Fire Department Instructors' Conference: "This fire service home inspection program, so well spearheaded by the I.A.F.C., is one investment with practically a guaranteed return. Figures over a wide geographical area indicate substantial reductions in fire frequency, with the consequent saving of both human life and property where fire

departments have implemented well-organized and publicized campaigns. . . ."

All these authorities stress the importance of a good program based upon personal contacts, publicity, education and follow-through. Let us explore the more important steps to such a home inspection campaign.

Fundamentals of a campaign

1. The local fire department must take the initiative. It is well to appoint a home inspection committee to gain public support. Be sure to include leaders in all major fields, including religious, civic, service organizations, press, business, educational, etc. And of course, choose fire department personnel with special care. Select a chairman who has not merely a "name" but will get things done.

2. Relate fire department facilities to the tasks in hand—

a. Have necessary maps, diagrams, etc. of streets and areas to be inspected, with company and battalion districts; also the necessary record forms.

b. Arrange personnel details, by companies, squads and shifts.

c. Designate inspecting apparatus companies (some departments detail ladder crews to operate with pumper personnel on inspections).

d. Predetermine communications procedures necessary for equipment to remain in service during inspections; report movements to headquarters. (Radio amplifiers are an asset.)

3. Hold pre-campaign meetings of department (and committees if appointed), to discuss details, including the following:

a. time element; days of week; time of day, etc.

b. Part to be played by each cooperating agency

c. Map inspection procedures (see following)

d. "Sell" the campaign to all concerned

e. Have clear understanding of delegation of responsibilities, etc.

Preliminary training essential: It should be remembered that dwelling inspections are different than routine company building inspections by whatever means. Personnel must be carefully coached in the special procedures to be followed in approaching the home, introducing their subject, meeting objections, handling noticeable and 'hidden' hazards, offering advice and recommendations, and leaving the premises. A number of departments have enlisted the services of local sales managers or others who have conducted house-to-house selling to help train fire department personnel. Such talent may be found in local service clubs—or among buffs.

Preparing public important: Remember the newspaperman's dictum: "Tell'em you're going to tell'em. Tell'em. And tell'em you told'em" in planning a successful dwelling inspection drive.

Here too, valuable assistance can be secured usually for the asking from local men engaged in public relations and publicity work. Treat your inspection program as a necessary product to be sold to your citizens of all walks, advises one fire marshal. Intelligent use of press, public radio and TV—if there are local stations—as well as other publicity media, telling the "who, what, where, when, and why" of the campaign will smooth the way to get into the home, get over the inspection and fire safety story, and get out, leaving a good impression on the homemaker.

Concentrate Heavily on Children: Reach the grownups through their children, utilizing local educational facilities in all grades, all schools, with appropriate appeals. But as a "must," secure the counsel and cooperation of the educators and teachers. The uniformed firemen has long been a hero to children. Good public relations, the cooperation of educational and civic authorities, and a well-planned and executed home inspection drive, will go a long way to further cement this relationship.

Printed Helps: In addition to general publicity, printed promotion, directed to groups as well as to individual property owners and occupants, is highly important. Even the use of simple postcards, giving householders advance notice of the arrival of home inspectors and following up their visit, will produce results. Also efficacious is printed matter that can be left with occupants at the time of calls. These can be home inspection blanks (procurable from the National Board of Fire Underwriters and/or National Fire Protection Association), folders, leaflets, booklets, etc. on home fire safety, etc.

Some departments have simple fire prevention souvenirs which can be presented to children. Others make it a point to encourage teenagers encountered on visits, to join their Junior Fire Brigade. Even if calls are refused, some educational safety literature should be left with the householder.

Miscellaneous inspection hints

Although many departments do not specify so, in their advance promotion of home inspections it is considered advisable by some chiefs to suggest basement inspections or attic and basements. In many cities, men are ordered not to enter living quarters of the house, even if invited to do so by the occupant.

Personnel on inspection shall operate in pairs, full uniforms and shall not smoke on the premises. Many chiefs insist men shall remain together at all times.

The majority of departments consider it advisable to approach single houses from the rear and enter by the rear or side entrance. Care should be taken not to track in any dirt. Most departments discontinue dwelling inspections in bad weather. Others have inspectors remove rubbers and/or raincoats upon entering in inclement weather.

A number of cities rule that if refused entrance and no request is made to call at another time, inspectors are not to double back.

It is a universal rule that no orders whatever, are to be issued by inspectors to householders to correct obvious defects. Only suggestions and recommendations should be given. The householder is not to be scared by a too obvious flashing of badges, official notebooks and forms. If the desired corrective measures are explained in the literature carried, these can be pointed out before departing.

Hours of inspection vary according to location, climate, and custom, but many cities specify 1:30 p.m. to 3:30 p.m., Mondays through Fridays. No calls are made on Saturdays, Sundays, or holidays. This does not apply to multiple dwellings.

If their apparatus is equipped with bells, some departments prefer these used to alert and summon firemen from the dwelling upon receipt of an alarm by the radio monitor rather than siren.

Companies on apparatus field inspection remain on the air, preferably with a driver monitoring radio. This man should

Continued on page 984

Speakers at Utah's statewide fire prevention conference held at Salt Lake City on July 17 included (left to right) Chief William Taylor, Burbank, Cal., IAFC director from the Pacific Coast Inter-Mountain Association; Chief Clyde Peterson, Ogden, Utah, state vice-president, IAFC; Jay W. Stevens, executive secretary, IAFC; Chief William Fitzgerald, Seattle, Wash., president, IAFC; Chief S. H. Edmondson, Pasadena, Cal., past president, Pacific Coast Inter-Mountain Association and Jay C. Newman, Commissioner of Public Safety, for the State of Utah

Miami's Chief, N. L. Wheeler preaches use of respiratory protective equipment, and practices it, as shown in this candid shot. Note pouch in bunker coat holding mask facepiece—*Miami Fire Department photo*

Miami Fire Department Has Long Record of Accomplishments

Visitors at the International Association of Fire Chiefs' 83rd Annual Conference will have opportunity to study numerous innovations that have made fire protection history

By CHIEF NEWTON L. WHEELER, SR.

ON JULY 28, 1896, A CITY was born on the shores of Biscayne Bay and the Miami River. The gossip then was of railroads, of fishing and farming, and the climate. Someone thought that the sunshine was a saleable factor and started publicizing the land where the sun and sea combined to make living pleasant, and the city mushroomed.

Today, sixty years later, railroads vie for attention with such things as airlines, atomic power, rockets, flying saucers, and trips to the moon.

What city is this, you may say? Why, Miami, Florida, of course, scene of the coming 83rd Conference of the International Association of Fire Chiefs.

The Miami Fire Department started with the city and has continued to expand with its tremendous growth. Beginning with one paid man and a handful of volunteers, the fire department now numbers 617 paid men and no volunteers.

A young fire department in a young city has this advantage: It can only look forward. The history of the Miami Fire Department like the history of the city it serves, is one of forward progress.

Progress begins early

Nearly 30 years ago the Miami Fire Department, after weeks of experiments, placed in service a loud speaker system to speed the dispatching of fire apparatus. That story was featured in FIRE ENGINEERING of November 14, 1928.

In the late 30's, the department again made the headlines when it equipped each piece of apparatus with radio receivers so the alarm dispatchers could contact the apparatus when it was away from quarters. Profiting by what was learned from this move, two-way radio soon followed, thus making direct communication possible between the alarm dispatcher and the apparatus officer. We believe Miami was the first city to use radio on all its fire apparatus.

The development of fog fire fighting during World War II for shipboard fires, proved an effective means of fire control and some farsighted chiefs started experimenting with it in the belief that fog application could be as successful on structural fires as it was on ship fires. Miami was one of the first cities where water fog was tested experimentally. A group of firemen was sent to the U. S. Coast Guard fire fighting school at historic Fort McHenry to study all phases of this progressive innovation. These men became the nucleus of fog fire fighters in the department; through them the entire fire force was trained in all elements of this progressive improvement.

Although the tourist, enraptured by its climate, may view Miami as merely a winter resort, the professional fireman sees the vast city in an entirely different light, even though he readily admits Miami's many attractions for the vacationer. As a major manufacturing center for example, Miami can produce "mean" industrial working fires—and it does. Each of these, as the fire records testify, is capable of testing a fire department's personnel, special skills, teamwork and mechanical facilities.

The introduction of water fog into the department was merely keeping pace with the increasing number and severity of fire hazards coincidental with the growth of the metropolis.

It became apparent almost from the start that effective use of water fog required fire fighters to get in close to the seat of the fire and this in turn, called for special respiratory protective equipment to enable them to penetrate smoke and toxic fumes.

Innovations in mask usage

Each Miami fire fighter was equipped with a filter type gas mask. This in itself was a most progressive step at that time, but the real innovation came with the adoption of a special carrying pocket, which became a part of each man's bunker coat, and in which the mask assembly is carried ready for instant service. After a few refinements, a standard mask-carrying coat was developed which is now known as the "Miami Bunker Coat" by clothing manufacturers.

It was not enough to outfit firemen with this mask assembly. The department saw to it that men were properly trained in the use of their respiratory equipment. Prior to the time when all men were equipped with gas masks, each new man received a brief familiarization of gas masks during his rookie training. With the whole department going into a new standard operating procedure, training had to be broadened to teach the old-timers as well as the new men how to properly use gas masks, and to sell them on the value of accepting masks as a regular part of their fire protective clothing.

It was necessary to determine by experiment how best to approach a fire with multiple lines (thermal currents caused by corradiating streams burned the men), how to ventilate for best re-

One of Miami's chemical wagons. The crew is operating two of the three preconnected lines carried on the apparatus. Each nozzle is discharging about 100 gpm at 30-degree fog pattern. Note that all men on the lines wear the filter-type mask in their special bunker coats
—Miami Fire Department photo

sults, whether men could penetrate deeper into a fire area with masks on and how long they could operate under these conditions.

It should be mentioned that the department maintains a supply of demand-type breathing apparatus and other special respiratory equipment, in the use of which the men are also thoroughly trained. And while on the subject, another story could be written around the department's mask maintenance program, which calls for periodic inspection of all masks by officers and special gas mask experts.

The general feeling was that men properly protected, and provided with light hose lines would, with proper training, combat most fires with a minimum amount of water and still control the fire. Speed was essential, so was water fog and wetting agents, and so was respiratory protection.

Mobility of fire fighting crews has always been a problem in fire fighting. A crew on a 2½-inch or 3-inch line is handicapped in movement over the fire area; lines are unwieldy and stiff; nozzles heavy, and time is consumed in layout, hookup, etc. So, in what proved another progressive step, Miami experimented with an apparatus specially designed for fog fire fighting and evolved a tank type truck carrying 500 gallons of water and a 500 gpm pump. To speed attack, three pre-connected 1½-inch lines were carried, each 200 feet long fitted with fog nozzles.

A proportioner was next developed by a member of the department whereby a chemical wetting agent could be added to the fire streams for better penetration into burning materials. These chemical trucks as they are known (Miami has five at present) are used as light, fast-attack units. They are backed up by engine companies in residential and light industrial sections of the city, and have proved their worth many times over. They have received much publicity in the fire service journals and the press.

Indirect fog application tests

In developing new techniques it is necessary to have a place to test ideas under controlled conditions. The changeover to fog made it imperative that the fire department have a building where fire crews could experiment with the theories of water fog and where training could be accomplished. Therefore a fire test laboratory was built on the fire department drill grounds. This was a two-story block building, built with special expanded aggregate. Seventeen fixed-position thermocouples were installed throughout the building so accurate temperature recordings could be made of heat rise and fall during the fire tests.

The exploratory committee of the National Fire Protection Association was set up in May, 1951, to make full-scale tests of the theories of fog application. This group felt that Miami's smoke house was the most suitable structure in which to conduct the tests they wanted to run.

During October and November of that year the committee used the Miami facilities for their purposes, the tests being planned primarily to determine the degree of effectiveness of the indirect application of water fog, rather than to develop specific scientific techniques.

For the fire tests, the ground floor was divided into eight frame rooms approximately 10 feet square, four rooms on each side, with a 10-foot aisleway in the center. A fuel load of about 10 pounds per square foot was placed throughout the building. A series of four test fires were conducted, but Tests 3 and 4, which involved the entire building, were the most complete and extensive.

Fog nozzles, set at approximately 30-degree pattern, with 100 pounds nozzle pressure, were used for extinguishment. Other nozzles of various capacities were also used during tests. Temperatures in excess of 1000 degrees F. were developed before water was applied, all temperatures being recorded on a potentiometer in an instrument building about 25 feet south of the fire building. But progress did not end here.

Additional test fires were built and fought in a condemned frame dwelling. Fog nozzles on three 1½-inch jump lines from one of the chemical attack units were used, with the addition of a wetting agent. Temperatures and observations were not recorded on these tests. These experiments, and others conducted since, have given further impetus to the scientific application of water fog.

The rescue crews were always on hand in case of accidents and to take blood samples of the men during different stages of exposure to the heat and fatigue, to see what the effects on body oxygen were on the men working with and without masks.

Miami Fire Department Instructor Captain M. E. Harrison explains functions to student Fireman D. C. Clark, Jr. In addition to classroom training, men get field workouts. All gas mask equipment is tested and serviced by members of the Miami Rescue Squad
—Miami Fire Department photo

Training center being built

A common objective in all progressive fire departments is the improvement of established techniques, and the application of new approaches and methods to the tasks at hand. The training staff of the Miami Fire Department, directed by Chief Fire Officer Milton Q. Bullock, is constantly seeking new and better ways to increase the effectiveness of the department in all fire fighting procedures.

From the standpoint of essential training, a need has been felt for an area where operational training could be developed; where, as the next logical step after basic training, chief officers could work out pre-fire problems in command and company coordination, where the individual performance was not as much a prime factor as the company operation as a unit.

In cooperation with Dade County Civil Defense and Federal Civil Defense Administration, a Main Control Center and Training Facilities are under construction on a 10-acre plot provided by Dade County, located about 10 miles from the center of downtown Miami.

The City of Miami agreed to build a Rescue Training Center, and as a result the bid of the Brinkley Construction Company for $57,907.00 was accepted on July 18, 1956, with 120 days allowed for completion.

The rescue training facility will include a five-story fire building and training tower so constructed that fires can be built and fought in it or that smoke can be generated and funneled to upper stories. The structure will be equipped with thermocouples and have a temperature recording room, with observation ports, hatches for raising or lowering "victims" or equipment, and a standpipe system.

Adjacent to the training tower will be a collapsed or bombed-type structure for rescue training. An area will also be provided for instruction in fighting aircraft crash fires, electrical and gas leak fires, mobile fires, etc. An artificial lake, at one corner of the grounds, will provide facilities for pumper drafting operations.

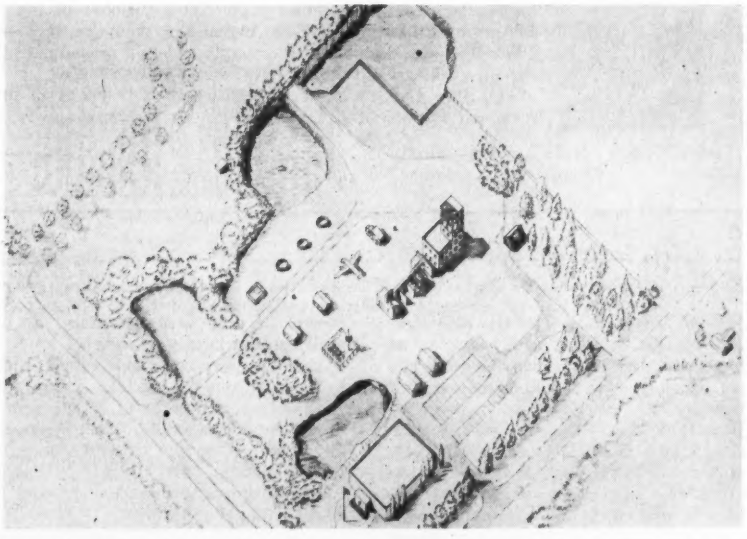
It is hoped that with these facilities we can develop a system of combined company operations, coordinated with other services, to solve rescue and fire fighting problems on an operational level. Additions may be needed in the future to round out the complete utilization of the area. However, this enterprise constitutes an essential step necessary to fill the gap between paper planning in firemanship and actual disaster operations.

A public relations builder

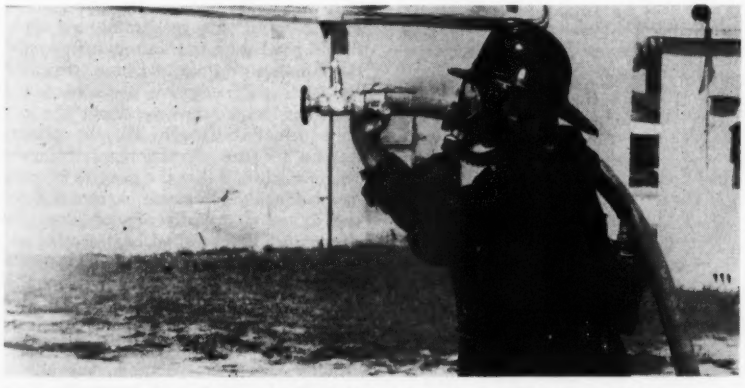
Miami, as we all know, is a tourist Mecca—a city that was brought to life by publicity, and publicity continues to play an important part in attracting visitors, including firemen, to the city. Some of these visiting firemen become so enamoured with the city that they become permanent residents.

The fire department has played an active part in the promotion of Miami in the eyes of the public. Paul W. Kearney wrote an article about the department's fog fire fighting techniques and use of gas masks, for the *Reader's Digest*; Miami's new telephone alarm system likewise has had wide publicity in *Popular Mechanics* and other magazines. Miami fire prevention promotion uses the facilities of the City Publicity Department to good advantage. The "JC's" have a "Miss Fire Prevention." In one stunt, "Miss Universe" was "rescued" from atop Burdine's Department Store by a ladder company. Aerial ladders are also employed by publicity cameramen to help them get strategic angle shots of the various events taking place in Miami.

The experiments of the Exploratory Committee on the Application of Water Fog; the chemical truck achievements in furthering the strategy of fire attack, using water fog with a wetting agent; the protection of fire fighters with gas masks; the new fire alarm system, all have received national, even international recognition, and have brought fire protection engineers and firemen in all grades to Miami to find out more about these and other progressive developments.



Control Center building and training grounds, being constructed by Dade County Civil Defense Council in cooperation with Miami Fire Department—*Courtesy Miami Fire Department*



Masks are "musts" in the Miami Fire Department. Here Fireman R. H. Doll models battle dress and over-shoulder use of 1½-inch hose fitted with 30-degree fog nozzle. Note mask filter on back of bunker coat and tube running to facepiece. When not in use, latter is carried in pouch shown under left arm—*Miami Fire Department photo*

Of course, new ideas and improvements are finding their way into the fire departments of many other cities, and this progress should be brought to the attention of the nation's fire service as a whole, so that the fire forces may continue to grow and improve their worth to their individual communities.

By setting up progressive programs and enlisting the talents of members of the department, and those kindred folk who have the department's interests at heart, a fire department can help to promote its municipality and help make it a place where people want to come to visit and possibly to live, at the same time further advancing the fire department itself.

Miami and its fire department eagerly anticipate the forthcoming Conference of the International Association of Fire Chiefs. □□

Chemistry of Catalysts In Relation to Fire Protection

By PAUL F. DeGAETA and ARNOLD A. WEINTRAUB

ABOUT THE AUTHORS

Paul F. DeGaeta studied chemical engineering at Cooper Union School of Engineering. He had been a member of the New York Fire Department for 18 years retiring as a captain attached to the Fire Prevention Education Unit, on August 1, 1956. He was a member of the faculty of the Fire College and the co-author of an official Fire College lecture on "Chemistry and Physics of Combustion."

Arnold A. Weintraub received his bachelor's degree in chemical engineering from the School of Technology, College of the City of New York. He has been a member of the New York Fire Department for 18 years, serving as a lieutenant in charge of the Fire Prevention Education Unit. He, too, is a member of the faculty of the Fire College, and has lectured widely on chemistry.

CATALYSTS AND THEIR RESULTING ACTION called catalysis, play an important part in our daily lives. While we are not aware of this influence, it nevertheless extends to innumerable phases of our existence. Without catalysts many of our everyday products would be impossible, or at least, less common. Consider fertilizers, explosives and industrial chemicals which depend upon nitrogen as their main ingredient. The manufacture of these substances is made possible by the use of catalysts to "fix" atmospheric nitrogen and to prepare synthetic ammonia, as well as nitric acid. Another case in point is the catalytic cracking of petroleum to produce high grade gasoline. Production of synthetic rubber, sulfuric acid, plastics, dyestuffs, synthetic shortening (Crisco, etc.) further illustrate this application. Even our digestive processes depend upon operation of a group of catalysts called "enzymes," without which foods such as starch, proteins and oils could not be absorbed by our bodies.

There is no doubt of the importance of catalysts to the average person. To the fire protection engineers, to those in the fire service, they become so much more important, because the very existence of their occupation concerns itself with the outbreak of fire and explosion, both of which could well be impossible without catalysis. On the other hand, catalysis plays an important part in the control of this very adversary, as we shall see later in this discussion.

It is the purpose of this article, then, to consider some basic information concerning catalysts and their action as they affect our profession, so that this knowledge may be applied to solving some of the problems in the struggle to protect life and property from the ravages of fire.

Theory of catalysts

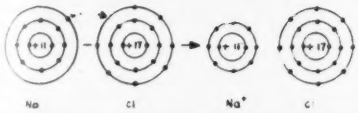
A catalyst may be defined as a substance which has a pronounced ability to alter the speed of chemical reactions without suffering any permanent change, itself, in the process.

A knowledge of chemical changes and how they take place is a necessary prerequisite to understanding the part played by catalysts in affecting their rates of speed.

We are all familiar with the fact that matter is constantly undergoing changes and that these changes can be classified as either physical changes or chemical changes.

A physical change is one in which certain properties of matter, such as color, state or density are temporarily changed by a change in conditions. When the original conditions are restored, the original properties return. Catalysts do not affect this type of change.

A chemical change, on the other hand, is one in which the composition of matter is altered and new substances with new properties are formed. A return to original conditions will not restore the original properties. Combustion, fire, explosion and respiration are examples of chemical changes. We know, too, that matter is made up of small particles called molecules, which exhibit the ordinary properties we recognize in different materials. The molecule, in turn, is made up of smaller particles called atoms, the smallest particles of matter that can take part in the process we call chemical change. Atoms are made up of particles, electrical in nature, and consist of a positive nucleus surrounded by a group of negative particles, called electrons, which revolve about the nucleus in orbits, much like the planets around the sun. Furthermore, the atom is so constituted that the positive charges just balance the negative charges and result in an electrically neutral atom. By disturbing this relationship, as, for example, when molecules collide with sufficient energy to dislodge electrons, chemical change is brought about. One atom loses electrons, becoming positively charged; the other gains electrons, becoming negatively charged. The attractive forces between the negative and positive atoms (ions, as they are called) hold the two together to form a new substance.



A simplified representation of the chemical reaction between an atom of sodium (Na) and an atom of chlorine (Cl). One electron leaves the sodium atom to enter the outer orbit of the chlorine to form a molecule of sodium chloride

The speed with which such changes are brought about varies widely. For example, solid, massive wood burns at a low rate of speed. This same wood, when finely divided and suspended in air, can react with the speed of an explosion. Furthermore, wood can exist in contact with the air for years without apparent change. Application of heat is necessary before self-sustained burning can be attained.

This leads to the conclusion that certain agencies can be brought to bear upon the reactants so that their rate of change can be greatly affected. Of the many factors that can alter the rate of chemical change, the four of primary interest to the fire service are: concentration of reactants, temperature, contact of surface, and catalysis.

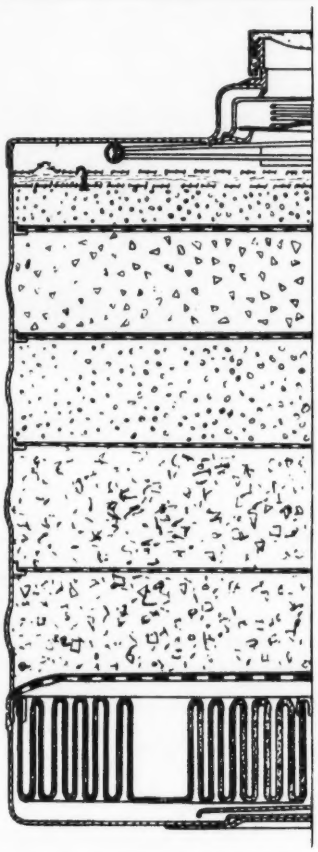
For our present purpose, only the last —catalysis—will be discussed.

In the preparation of oxygen from potassium chlorate, the gas is evolved with great difficulty even when the substance is heated almost to its melting point. In the presence of a small amount of manganese dioxide, however, oxygen is set free in large quantity at a much lower temperature. This classical experiment is familiar to all who have taken high school chemistry. Berzelius, who first gave the name to this phenomenon, likened the action of a catalyst to that of a lubricating oil on machinery. We, in the fire service, may compare this effect with that which a chief officer has, in speeding up the action of a group of slow moving fire fighters, simply by his appearance on the scene. A remarkable transformation takes place; the work is done faster and better merely by virtue of the presence of the chief who took no actual part in the process. Thus it is with catalysts.

It requires only a small amount of a catalyst to greatly alter the speed with which large amounts of reactants undergo chemical change. The decomposition of acetaldehyde, for example, increases in speed by 10,000 times the normal rate in the presence of a small amount of iodine vapor. Hydrogen peroxide in water solution will decompose in the presence of minute quantities of copper compounds, dissolved when the water is distilled in copper coils or vessels.

Catalysts also exhibit a high degree of selectivity in their influence. A catalyst which is effective on one chemical change may not affect any others. In addition to this, certain catalysts exhibit their effects only at certain temperatures and are inactive at others.

They can either accelerate chemical changes or slow them down. We call



Pure anhydrous calcium chloride, which acts as a dryer, preventing moisture from reaching "Hopcalite."

"HOPCALITE" which acts as a catalyst to convert carbon monoxide (CO) to carbon dioxide (CO_2) by uniting the oxygen (O_2) in the air to the carbon monoxide (CO) thus forming carbon dioxide (CO_2) which is a relatively harmless gas.

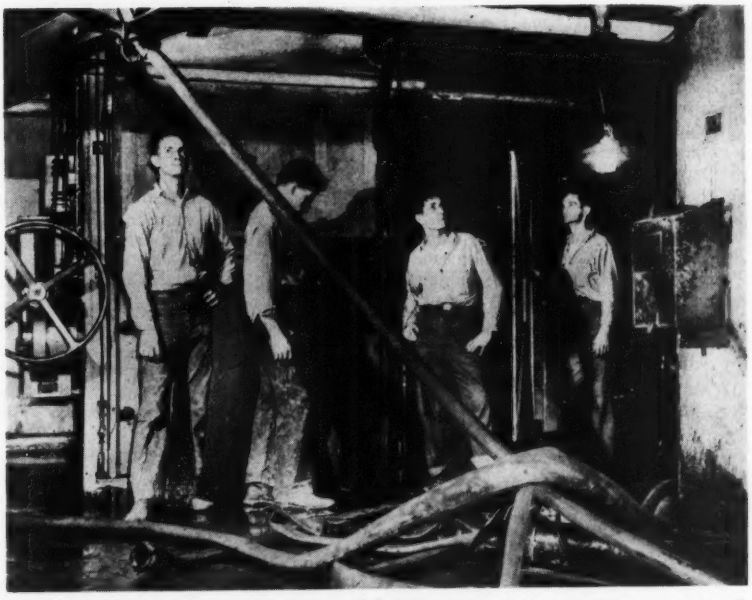
Silica gel which acts as an absorber of ammonia; also as a dryer, preventing moisture from reaching "Hopcalite."

Impregnated activated charcoal and caustite for absorbing organic vapors and acid gases.

Impregnated activated charcoal and caustite for absorbing organic vapors and acid gases.

Cellulose filter for filtering toxic dusts, fumes, mists, fogs, and smokes.

A catalyst is essential in the modern canister mask. This sectional view shows how Hopcalite serves as the catalyst to convert carbon monoxide to carbon dioxide
—Courtesy Mine Safety Appliances Company



Many were killed when accelerated decomposition resulted in the explosion of a hydraulic ram using hydrocarbon oil and compressed air aboard the Aircraft Carrier "Leyte." Decomposition of the oil, under conditions of temperature, pressure, and frequency of use may have resulted in the formation of organic peroxides and aldehydes, which could have catalyzed the reaction to the point of detonation. Photo shows interior of carrier during operations

those substances which speed up reactions, "accelerators," "promoters" or "positive catalysts," and those which slow down reactions, "inhibitors" or "negative catalysts."

In some cases, a product of the reaction may act as a catalyst, in which case it is called an "autocatalyst." For example, oxides of nitrogen may be present in nitrocellulose as a product of its own decomposition. These oxides catalyze the decomposition and promote the detonation of the nitrocellulose. In this case, the oxides are called autocatalysts.

Inhibitors may act directly in slowing a reaction, as in the case of lead tetraethyl which prevents the oxidation of hydrocarbons in gasoline during compression of the gases before the spark is introduced. In other instances, the negative catalysts may act indirectly by affecting the action of a positive catalyst, which is normally present as an autocatalyst. This is illustrated in the case of the decomposition of nitrocellulose with formation of the oxides of nitrogen. In the presence of urea, the catalytic power of the oxides is destroyed so that the material is stabilized and may be handled safely. Substances which act to destroy or minimize the effect of a catalyst are called, "catalyst poisoners," or simply, "poisoners."

There are also some substances which are not themselves catalysts, but when added to a catalyst, they increase their power. Such catalyst intensifiers are called "boosters" or "supporters." In the preparation of ammonia from nitrogen and hydrogen, iron is used as a catalyst. In addition to this, alumina is used to boost the ability of the iron to catalyze the reaction.

It is also a fact that various surfaces can catalyze certain reactions. In combustion reactions especially, the catalytic action of surfaces plays an important role. Investigations have shown that a large heated mass of iron will accelerate the burning of illuminating gas and air. It is also known that practically all surfaces will catalyze the burning of hydrogen and and carbon monoxide in air. The surfaces in these instances act in this way even though they are at temperatures below the ignition point of the gases. As the temperature of the surface increases, the power to catalyze reactions also increases, so that when incandescence is reached, the effect upon combustion reactions approaches astronomical proportions. Some of the unexplained and mysterious explosions that have occurred at fires after they were burning for a period could probably be traced to this property of heated surface.

The ability to adsorb gases is exhibited by such surfaces on which these gases are concentrated and activated. (Adsorption is "the adhesion in an extremely thin layer, of the molecules of gases, of dissolved substances, or of liquids to the surfaces of solid bodies with which they are in contact.") The attractive forces existing on the surface break down the molecular structure and release the elements in the atomic or "nascent" state, in which condition they are highly reactive. Some surfaces are capable of adsorbing certain gases in volumes which exceed their own volume by many hundredfold. A further result of this concentration of gases on a surface is that heat is released from the condensing gases and added to the other agencies which are affecting the speed of reaction. Heat, as we know, exerts a significant influence on the speed of reactions, for some cases of combustion, doubling the speed for every 18 degrees F. rise in temperature.

The true cause of the Texas City disaster may never be known, but one theory advanced is that products of decomposing ammonium nitrate acted to catalyze the reaction to the point of detonation, resulting in the blast that killed over 500 persons and caused millions of dollars property damage

Catalysts in action

We have learned, then, that catalysts can increase or decrease the speed of reactions. In the first service we are particularly concerned with the chemical reaction called combustion or burning. It has been known for a long time that most cases of combustion cannot proceed unless a minute amount of water vapor is present to catalyze the reaction. For example, if a mixture of carbon monoxide and oxygen be perfectly dried by laboratory methods, it is almost impossible to have them react. When a small amount of water vapor is introduced, then the mixture can easily be ignited and exploded.

At first thought, there seems to be no practical significance in this fact because it is difficult to keep any such mixture free from moisture. However, it is not beyond the realm of possibility that some day a substance will be found to destroy or curtail the power of water to catalyze these reactions. When that bright day arrives, the fire service will have at its disposal the best fire fighting tool since man first discovered that water could extinguish fire.

There is still another practical implication in this fact which may be useful to us at this time. It is well known that, as the temperature of the air drops, the amount of water vapor in it also drops, so that at the temperatures prevailing in arctic regions, so little water vapor is present that sparks of low intensity will not ignite some ordinary gas-air mixtures. With the increased activity going on in these regions, it is both a happy and an unhappy fact that this is so. It is happy for the fire protection engineer in that ordinary sparks may not ignite combustible gas-air mixtures, thereby decreasing the chances of fire. It is unhappy for the transportation engineer in that an intensified spark is required to ignite the gasoline-air mixture in internal combustion engines.

Surfaces, as we have seen, also exert powerful influences on combustion reactions. In this respect heated metals, especially iron, can catalyze many reactions which might proceed normally at much lower speeds. For example, hydrogen and oxygen can remain unchanged while mixed at ordinary temperatures. Only when the temperature is raised to about 1000 degrees F. do they interact and explode violently. Certain surfaces, however, will cause this ignition even at ordinary temperatures. At elevated temperatures the reaction takes place with added violence.

A practical application is made of this fact in one brand of cigarette lighter, in which a hydrocarbon mixture is drawn through a special metal mass, which catalyzes oxidation of the vapors to produce a flame.

During the progress of an actual fire, it is difficult or almost impossible to know exactly the conditions under which chemical reactions are proceeding. Oxidation reactions, we know, are subject to catalytic influences. There are numerous other reactions, decompositions and interchanges which can proceed simultaneously and which are also subject to catalytic influences. At the same time, we do not know what catalysts may be present to exert their powers. Yet in numerous fires some very commonly known catalysts are in evidence. Heated iron and other metals are almost always present. Copper oxide, an excellent catalyst in some reactions, may be formed by oxidation of copper during a fire, adding its influence to the reactions. Aluminum and its products, which catalyze organic reactions, are also commonly found, and may adversely affect organic products of combustion, to add fury to an already violent reaction.

Products of ordinary wood fires, as a further illustration, contain substances

The reaction of hydrochloric acid with aluminum of a poorly purged storage tank in a Philadelphia processing plant may have formed aluminum trichloride, which in turn, acted as an autocatalyst causing accelerated decomposition of the mixture, releasing excessive heat and pressure to rupture the tank which caused the deaths of ten firemen —*Philadelphia F. D. Photo*

which belong to a class of organic catalysts called aldehydes, as well as acetic acid by-products, and possibly ketones, which are also classed as organic catalysts.

We have already considered the action of the oxides of nitrogen in promoting the detonation of nitrocellulose. Under ordinary conditions, urea inhibits their action, but under fire conditions, it is entirely probable that these oxides are formed so fast and in such quantities as to overcome the influence of the urea. The violence exhibited by a burning mass of celluloid could very well be traceable to this.

Later, some other cases of catalytic action will be taken up, but at this time consideration must also be given to those actions which tend to inhibit or slow down combustion reactions.

The most familiar example of an inhibiting agent is lead tetraethyl in ethyl gasoline, which was mentioned before. Without the use of this product, the internal combustion engine would be a less efficient machine because the motor would be subjected to pre-ignition knocks and loss of power. Another familiar inhibitor is acetanilide which keeps ordinary hydrogen peroxide from decomposing too rapidly. Others are compounds used to keep rubber tires from aging prematurely and sodium benzoate to keep foods, such as ketchup, from spoiling.

Less familiar to us is the fact, as suggested by some authorities, that at high temperatures, nitrogen in the air acts as an inhibitor for certain combustion reactions. This function is in addition to that of diluting the oxygen. It is entirely possible that nature, in its orderly design, intended nitrogen to be such an inhibitor to prevent a general conflagration which could envelope the entire earth, once having had a start. The elements of such an inferno are ever present, the oxygen of the atmosphere in intimate contact with combustibles (forests, gases, etc.), and the heat for ignition supplied by the first lightning flash. We find, however, that although fires can be started easily and will continue to grow, they never reach the point of involving the entire globe. It may be that the inhibiting powers of nitrogen (and perhaps other atmospheric substances) do not exert themselves until a certain temperature or quantity of heat is attained, when the reactions are inhibited and held in check. This could also explain why nuclear explosions, with temperatures ranging to tens of thousands degrees, do not involve the entire atmosphere.

In actual fire extinguishment use is made of catalytic action. The so-called loaded stream extinguishers are effective on fires because of the inhibiting power of certain alkali salts dissolved in water. On Class "A" fires, these extinguishers put out the flames rather suddenly and in addition, exert a definite fireproofing effect, by preventing flash backs. On Class "B" fires there are no smothering vapors produced, but the flames are quickly extinguished. In both cases, the effective extinguishing action is attributed to the catalysts in the stream which inhibit oxidation.

This fact was discovered quite by accident about 25 years ago, by two researchers, Thomas and Hochwalt, when they noticed that gasoline flames were suddenly extinguished by a water solution of sodium potassium carbonate. They then conducted rather exhaustive tests to find other substances which exhibited this property. The results obtained were so startling, as to be unbelievable. For example, a 20 per cent solution of potassium nitrate in water, extinguished an oil fire with greater ease than a like volume of carbon tetrachloride!

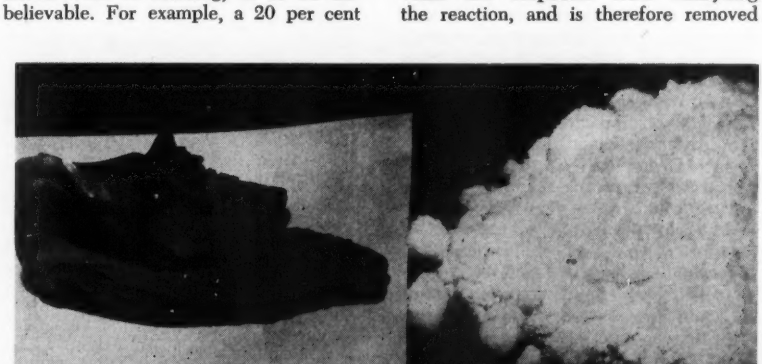
They found, also that with few exceptions, only compounds of the alkali metals possess this effect. It also appeared that the extinguishing effectiveness increases with increase in atomic weight of the alkali metal, and that the oxygen-bearing radicals were generally more effective.

The loaded stream extinguishers are a practical application of these investigations.

Some authorities have also shown that carbon tetrachloride could extinguish burning charcoal when present in air in quantities of about 5 per cent. In this case the oxygen percentage is reduced by only 1 (21 per cent to 20 per cent) and the extinguishing action cannot be attributed to dilution or smothering. It is certain that this is due to a negative catalytic action exerted by carbon tetrachloride vapors.

The British Department of Scientific and Industrial Research, Fire Research Technical Paper No. 2, states concerning the action of halogenated hydrocarbon extinguishing agents, such as carbon tetrachloride, "Their extinguishing capacity depends more particularly on their influence on the chemical reactions involved in the propagation of the flame." They also state that some other halogenated liquids have extinguishing powers superior to carbon tetrachloride, particularly chlorobromomethane and trifluorobromomethane.

In the field of fire fighting an important application is the catalytic effect in a filter-type gas mask for operating in atmospheres containing dangerous amounts of carbon monoxide. In this case, the gases breathed are drawn through a series of filtering media, of which the most important is a material called "Hopcalite." This substance is a mixture of metallic oxides of manganese, copper, cobalt and silver, which acts to catalyze the union of carbon monoxide with the oxygen in the air to form carbon dioxide, which can be breathed into the lungs without injury. Water in this case prevents the Hopcalite from catalyzing the reaction, and is therefore removed



Rapid decomposition of ammonium nitrate (right) **as a result of catalytic reaction, is believed by some to have caused the explosion which ripped apart the "S. S. Grandcamp" (fragment of which is shown at left)** —*Photo by U. S. Coast Guard*

from the gas mixture by first passing through a layer of calcium chloride.

$$A + C \rightarrow AC$$
$$AC + B \rightarrow AB + C$$

One theory of catalysis, under certain conditions, proposes that a reaction between A and B in the presence of catalyst, C, proceeds according to this mechanism.

Catalytic decomposition

The examples cited seem to be ordinary in nature and do not stimulate any great interest on the part of the average fire fighter. Only when some extraordinary disaster strikes, do we stir from our lethargy and make any real attempt at applying known scientific principles to finding the causes. Such a case, with which we are all familiar, is the chemical explosion which occurred two years ago in Philadelphia, and took the lives of ten fire fighters. A mixture of chlorinated solvents (orthodichlorobenzene, ethylenedichloride and propylenedichloride) was stored in a poorly purged aluminum tank, that had previously held cocoanut oils. It is held that a small amount of moisture present in the tank may have acted upon the chlorinated hydrocarbons and produced hydrochloric acid, in a process called hydrolysis. This acid then reacted with the aluminum to form aluminum trichloride, which acts as an autocatalyst and caused an accelerated decomposition of the mixture with release of excessive heat and pressure, which were prevented from escaping because of a clogged vent. As a result the tank ruptured and trapped the fire fighting force before they knew what was happening. Another possible explanation is that heat from the sun beating down on the tank caused a reaction between propylenedichloride and aluminum with the formation of aluminum trichloride catalyst.

Any compound of aluminum, magnesium or other light metals, and halogen derivatives, or any potential combination of these chemicals, should be viewed with suspicion and kept under careful control.

Another example of accelerated decomposition occurred on the aircraft carrier U.S.S. Leyte several years ago (and also on the U.S.S. Bennington), when a hydraulic ram system using hydrocarbon oil and compressed air exploded and caused a severe fire and loss of life. Investigators believe that under the conditions of temperature, pressure and frequency of use that existed, decomposition in the oil may have resulted in the formation of organic peroxides and aldehydes, which could have catalyzed the reaction to the point of detonation. As a result, the Navy is now using a noncombustible water solution of glycol in the rams, which is believed to be free from the danger of accelerated decomposition initiated by catalysts.

It should be pointed out that conditions of heat and pressure affecting organic materials must be considered dangerous because they can cause the formation of some product which has the potentialities of a catalyst.

While on the subject of heat and pressure, it is well to mention the Texas City disaster of 1947. It is known that ammonium nitrate was undergoing decomposition at the time of the explosion. In fact, fire fighting was in progress for over an hour and the detonation took place suddenly and without warning, shortly after the holds were battened down. While ammonium nitrate was considered a rather safe material until that time, it has been shown in laboratory tests that a violent explosion can be brought about by subjecting the material to certain conditions of heat and pressure, together with confinement of the products of decomposition. In this case, it is likely that some products of the decomposition, possibly oxides of nitrogen, act to catalyze the reaction to the point of detonation.

This theory is further borne out by results of tests by the U. S. Department of Commerce following the Texas City explosions. All attempts to explode ammonium nitrate by heating in test bombs were unsuccessful when in contact with air. However, when the atmosphere in the bomb was replaced by a mixture of carbon monoxide and nitrous oxide (products of its decomposition) then the material exploded violently. One very important recommendation made is that confinement of the products of decomposition and combustion must be avoided, in case of fire involving ammonium nitrate. Authorities further state that no instance is known of an explosion being caused by heat or fire alone.

The number of catalytic reactions that can possibly occur under fire conditions is so large that space permits mentioning but a few. An exceedingly common occurrence is that of activated charcoal in condensing combustible gases and oxygen on its surface and causing fire to break out in a process called "pyrophoric action." Activated charcoal can easily be formed by low heat acting on carbonaceous material, such as wood. A steam pipe or chimney flue in contact with wood trim can produce this form of charcoal.

It's an old parlor trick to show how you cannot ignite a lump of sugar with a match until you first dust it with cigarette ash, which in this case is the catalyst

Charcoal, embers and coke, which are produced by the destructive distillation of carbonaceous material during a fire may act as catalysts in speeding the combination of hydrocarbon gases, which are themselves released in the process, with the oxygen of the air.

In the field of fire prevention, too, a knowledge of catalysts is useful. For example, knowing what normal catalysts are stored in a plant will give some idea of how storage facilities should be arranged so that the catalyst and the material it acts on can be isolated. In addition, many catalysts themselves are highly hazardous chemicals. Plastics catalyzers such as benzoyl peroxide and similar materials, for example, are thermally unstable at temperatures as low as 165 degrees F.

Future of catalysis in the fire service

It is obvious from our discussion, that catalysts have an important bearing on the fire service. Because they are subject to definite natural laws, it follows that we can hope to put them to use, under certain conditions, to aid us in our fight against fire. Industry, already far ahead of us in the use and knowledge of catalysts, has progressed to the point where predictions can be made as to the proper catalyst needed to activate a specific reaction. Perhaps, in the not too distant future, we too, may couple scientific research with inventive genius to make catalysts do a better job for us. Like the far-sighted industrialists, the authors have made some predictions which they believe will come true, provided enough encouragement is given to those who wish to apply scientific principles and methods to solving the problems of the fire service. Some of these are listed below for further contemplation and study.

1. Use can be made of catalysts as an extinguisher, perhaps in the form of paint, which would release an inhibitor at a certain temperature to stop any fire which breaks out. A similar use is the incorporation of an inhibitor dissolved in water in a conventional sprinkler system to exert its effect through operation of sprinkler heads.

2. A detection device which would transmit an alarm when exposed to certain gases, heat, smoke or fumes. Selective catalysts might be used to guard against specific hazards. Perhaps they would shut down air conditioning plants, close fire doors and disconnect power. It must be pointed out that they would be less likely to be accidentally activated than light sensitive devices (photoelectric cells).

3. An automatic design for feeding a

Continued on page 990

Left: As Columbia, S. C., apparatus approaches intersection, the officer notifies the dispatcher by radio and the traffic lights and corner siren are operated for clearance. **Right:** The fire alarm operator may remotely control all the city traffic lights and corner sirens from a single point. After the apparatus clears an intersection, operation in the normal manner is restored to the corner controller

—Photo courtesy General Electric Company

Electronic Traffic Control to Speed and Safeguard Fire Force Response

Experiments indicate drivers of emergency vehicles can control street traffic signals from their moving vehicles, at a distance. It's all done by short wave radio

A Special Fire Engineering Report

OVER THE YEARS, traffic accidents involving fire apparatus have not only proved costly and disabling to fire departments, but have unnecessarily endangered the lives of firemen responding to and returning from fires and other emergencies. Such accidents have caused serious delays in response of fire forces which in turn, proved costly in terms of lives and property endangered.

Many accidents involving fire and other emergency vehicles have been recorded in the pages of Fire Engineering, together with the measures being taken to reduce the toll and the cost. But notwithstanding all efforts, including stiffening of penalties for traffic violators, the number and severity of these accidents continue to mount.

Operators of fire department vehicles have not always been blameless in this carnage. Many accidents have been the direct result of "carelessness, unconcern, heedlessness and downright negligence," according to Fire Chief Edward J. Blohm of the Detroit Fire Department.

If any city in the country should be familiar with the problems of automotive traffic hazards and control, it is the "Automobile City" of Detroit. Nevertheless so serious has this situation become that the fire commissioners and Chief Blohm have issued orders that apparatus shall be brought to a complete stop on approaching any intersection with either a changing light or a red light against them, a stop street, or a railroad crossing not equipped with flashing warning signals or a warning gate.

In his directive to the department, Chief Blohm said, "Modern vehicles with high powered engines providing unprecedented speed and acceleration, coupled with ever increasing traffic volumes, congestion, great numbers of inexperienced or excitable drivers who become confused or panic upon the sound of approaching sirens or flashing warning lights, make it necessary that this department reappraise our practice in dealing with traffic while responding to alarms."

Further he points out, "Existing local and state traffic laws and regulations governing fire apparatus responding to emergencies do not protect the driver or the city from the consequences of a reckless disregard for the rights and safety of others."

He pointed out that "recent court decisions in Michigan have held drivers of fire apparatus liable and responsible for reckless driving."

Detroit is not the only municipality to reappraise its response problems in the light of present and increasing traffic hazards. All of which emphasizes the vital need for some method, system, or device, for making safer and swifter the response of fire and other emergency vehicles.

As another prominent fire chief said,

"What does it avail us to clip seconds off fire detection and alarm transmission and to speed getting out of our quarters and underway for the emergency, if we are going to have to set our pace with the slowest traffic, or else step on it and take chances of serious accidents?"

Search for a system

From the introduction of the first electrically-controlled traffic lights the fire service has found its traffic troubles multiplying. The traffic laws may give fire apparatus the right of way, as they do in most states, but the mortality tables show that laws and regulations alone cannot and will not safeguard response of personnel and equipment. Something more than regulations must be added if maximum safety is to be had.

Over the years public safety officials have searched for that "something." Nearly all cities have either experimented with, or have adopted some form of control designed to clear the way.

Unfortunately each such experiment up to the present time has introduced certain new problems even while helping to alleviate the previous traffic headache. As modern traffic congestion increases day by day, the weaknesses and drawbacks of the older control systems become more apparent.

There are two general types of central traffic controls of particular interest to the fire service. They are:

1. Wired control—Essentially a remote switching of either the central master controller or of intersection controllers. The method can be applied to the traffic lights in a pattern designed to meet the needs of the community. By throwing the proper switch all lights in the desired area can show the emergency signal, either in a continuous route or in a "blanket" pattern. The mechanical operation of switching signals is done by the headquarters dispatcher or a station fireman before leaving quarters.

2. Wireless control—While similar in operation to the wired control, the use of radio eliminates the wire connections necessary in the former. Electronic tone signals are transmitted to the intersection controllers which are equipped with receivers designed to respond to the tones. By selecting the proper tone codes, the desired route of control can be set up by the dispatcher. Operation of such electronic systems may be by central station dispatcher or other remote control.

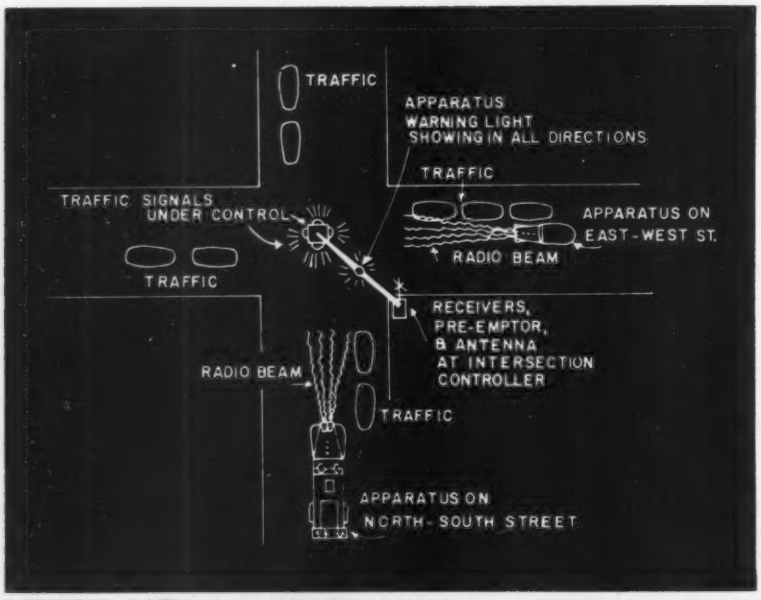
The most recent system, described in detail later on, is the driver-operated control for which high hopes are advanced by some authorities.

Operation of both wired methods is similar. In case of an alarm of fire, the dispatcher may set all signals red, or yellow, as has been predetermined. In some present installations this may be over common routes which fire apparatus would normally follow in response to certain areas.

The shortcomings of both of the methods are readily apparent. The length of time the signals must remain under control of the "pre-emptor" (even though automatically returned by a time-delay relay) is determined by the distance and the time required for the apparatus to clear the controlled lights. In some cities this may be inordinately long with the result that traffic congestion builds up, sometimes in areas far remote from the actual emergency.

Another, and far more serious, drawback is the dangerous possibility of apparatus simultaneously approaching a controlled intersection from two directions. With the present noise levels of average communities added to the warning siren on each apparatus, it is practically impossible to expect the driver and officer of one piece of apparatus to hear the approach of another from a converging street.

Some departments have attempted to rectify this possibility by specifying definite routes of response for each company. But it has been proved that even this cannot overcome the hazards of enforced route changes necessitated by street construction or delayed response. Multiple alarm apparatus that may be operating in areas not commonly familiar to all the personnel poses an additional hazard.



◀ Diagram of a typical radio-controlled operation of corner traffic signal. An impulse from one piece of fire apparatus has placed the intersection under control of the pre-emptor while the signal from a second vehicle has caused the apparatus warning light to flash a danger signal to the converging drivers

Aerial ladder entering a radio-controlled intersection. The apparatus warning light can be seen suspended near the elevated traffic signal. In case a second piece of apparatus approached the same intersection, the flashing light would warn the driver of the danger
—Photo courtesy Eagle Signal Corp.

In a number of cities these predetermined response streets or lanes have been designated by signs so that local and visiting motorists may be governed accordingly. Other cities have indicated these routes by both signs and sirens. However, these expedients have been only partially beneficial. Motorists apparently continue to wend their own inimitable, thoughtless ways.

Although only indirectly related to the question of traffic signal control, nevertheless one experiment being undertaken by several cities, including New York, offers some hope of benefit. This is the establishment of fire lanes on one-way streets. These lanes are usually in the center of the roadway, and are marked off by yellow or some other special color designation. Upon hearing siren and/or bell, the drivers of vehicles are expected to immediately swing into other traffic lanes, thus providing a clear path for the responding fire apparatus. This experiment is being watched with interest and FIRE ENGINEERING will later bring its readers the results of the installations.

Visual and audible warning

Many departments have experimented with methods of remotely controlling traffic lights at individual intersections. The use of "corner sirens" to give advance warning of the approach of apparatus has been added in some cities to further expedite the response. Coupling the audible siren with the abrupt change of the visual signal is felt to be an unmistakable indication to the motorists and pedestrians which results in greater safety for all concerned.

Columbia, S. C., installed this type of control several years ago. As reported in the December, 1952, issue of FIRE ENGINEERING, it consists of an operating panel containing remote control switches for each of the city's 88 traffic lights. The first responding apparatus notifies the dispatcher of its approach to an intersection by means of the mobile radio unit. The dispatcher then changes the signal indication to "flashing amber" and the corner siren sounds a simultaneous danger signal. After the fire truck clears the intersection the dispatcher is notified by a radio signal and he remotely returns the signal to the intersection controller by restoring the panel switch to the "off" position.

This method of control has the advantage that only the intersections concerned need to be controlled and apparatus arriving from a cross-street have both visual and audible warning (from the radio) of possible danger. However, the extensive cable requirements and physical operating limits of the controls of this system pose problems for some of the larger cities.

Electronic signal control

In recent months several methods of mobile radio control of traffic signals have been advanced to solve the problem. Two of the representative systems use a unique application of radio to control vehicular movements at individual street intersections with the added highly essential safeguard of visual indication to the apparatus drivers that the system is operating, and that fire or other emergency vehicles may be approaching the intersection from a side street.

The advantages of this new "spot" method of traffic regulation are readily apparent. The control of the system is vested in the operator of the vehicle that is approaching the intersection and not by some operator at a distance who is totally ignorant of the local conditions being encountered by the various responding units. Only the signals at the intersection immediately ahead of the vehicle are affected and traffic stoppage is centered at a single point. The length of time required for vehicle clearance of the intersection is only a matter of seconds, allowing quick resumption of traffic flow.

Perhaps the most important advantage of the revolutionary idea is the warning given by certain of these systems when two emergency vehicles approach the same intersection from cross-streets. Immediately a signal light starts flashing out its message of danger to the drivers. It is easy to visualize how great a safety factor such an operation can be to firemen responding to an alarm.

The compact, highly directional vehicle antenna used by one manufacturer projects a signal about one-quarter of a mile in front of the vehicle with a width of 200 feet
—Photo courtesy Electronic Protection, Inc.

Equipment function

The operation of the representative systems are similar in detail. All vehicles required to respond on emergency service are equipped with a small radio transmitter and a directional antenna. The mobile unit operates in the UHF (ultra-high-frequency) region of the radio spectrum and has an effective range of about one-quarter mile. The highly directional antenna designed for mounting on the hood, projects a narrow signal beam forward of the vehicle. The narrow beam prevents the transmitted signal from interferring with the traffic lights that may be located on parallel streets, and the low power allows only those lights immediately in front to be controlled, thus effectively preventing traffic jams in unwanted areas where control may be unnecessary.

Operation of the unit is by means of a switch located on an operating panel which can be conveniently mounted under the dash of the vehicle. As the driver approaches the intersection, he presses the control switch and the signal is transmitted.

The actuating signal is projected to a receiving antenna mounted on or near the traffic light controller. This signal is in turn picked up by a small receiver located within the controller housing and is passed along as an impulse to a preempting relay which automatically takes over control of the intersection lights in a predetermined method. Upon passage of the apparatus, the lights are returned to the supervision of the controller. An adjustable "hold" relay can be preset at any reasonable time for this return cycle.

Should two vehicles approach the same intersection at the same time, a warning signal light immediately begins flashing a visual signal to the drivers that caution must be exercised.

Minor differences of systems

The operations of the present representative systems are almost identical in detail. However, there are a few minor variations that may be important for some areas. Both systems are very flexible and the traffic lights can be set to operate in any given pattern as desired.

In one system, a special light known as an "interrogation" light faces each traffic lane. When the radio signal is transmitted and received by the traffic controller, the interrogation light is actuated and this notifies the driver by its steady glow that the system is under control of the radio signal. If two vehicles approach the intersection from converging streets, the interrogation light facing the first vehicle remains steady while the light facing the second vehicle flashes a continuous warning to indicate that caution is necessary.

In the second system, the sequence of operation can be adjusted to suit the operating requirements. In one city presently installing the system, all traffic lights on the intersection flash a yellow caution light as soon as they are activated by radio. This warns the motorist of an

Continued on page 985

What Progress in Fire Service Communications?

National expansion in every field is multiplying fire hazards and increasing demands on the nation's fire services. How are we measuring up to these demands? What part does communications play in the picture?

THE PHRASE "WORLD WAR II" may be shopworn by now, but it will suffice as a yardstick to define the end of one period and the beginning of a new and possibly momentous era in the nation's fire service communications.

The postwar years have witnessed vast economic expansion in all fields and endeavors. With it has come increasing demands upon the country's fire protection forces. Notwithstanding marked technological and other progress in the science and profession of fire suppression, the number of fires and of severe, large-loss fires and the total losses of life and property by devastating fire all continue to mount. This is in the face of the greatest effort at fire prevention the nation has ever known.

In this epochal struggle to at least retard, if not lower these catastrophic losses, every detail and operation of fire control and extinguishment is undergoing searching analysis. And, because it plays so important a part in the picture, fire service communications are being weighed and evaluated, both as to the progress made, the tasks presently facing the services and those of the forbidding future.

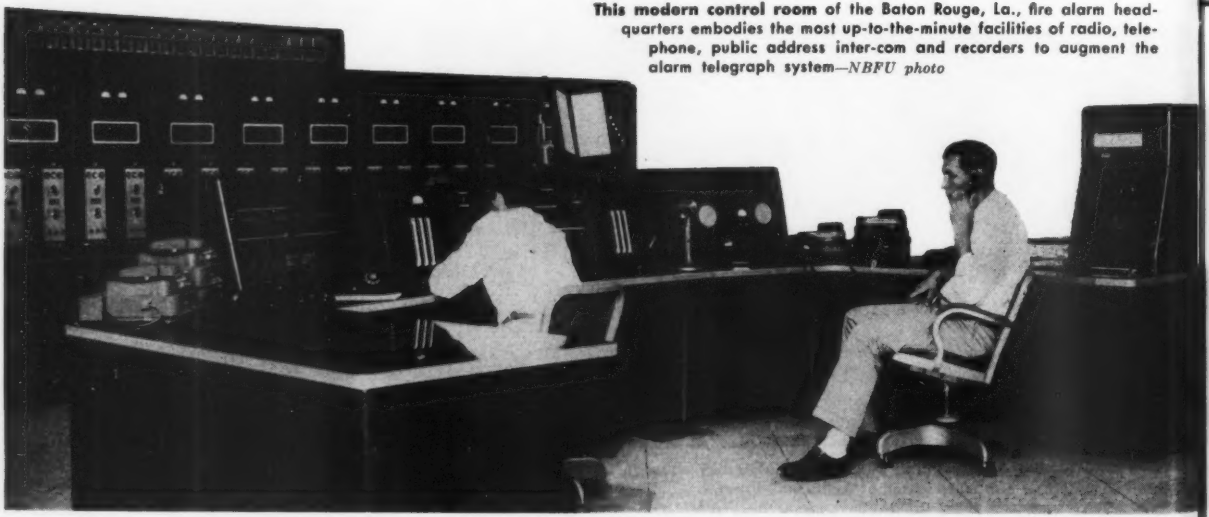
Every fire chief and superintendent of communications is conscious of the increasing problems posed by previously expanding population, industry and business. FIRE ENGINEERING has previously detailed these problems—the movement of people and enterprise into the suburbs, the burgeoning of rural areas into full-blown communities, resulting in the call for more and better equipped fire forces and the pressure to improve existing facilities, not the least of which are communications.

It is common knowledge that many of our municipal fire alarm systems have not progressed in extent or quality with certain other improvements in fire protection. Fire department budgets have been pared in all details, but those for fire communications have in many instances suffered a major operation. In some cases our fire communications plants are almost beyond treatment and repair, and the cost of complete rehabilitation and replacement runs into fantastic figures. Under these conditions, it is no wonder municipal government in too many instances seeks for and entertains palliatives which can never hope to cure the basic ailments.

Not only do we find, at least in the wired systems, the need for replacement of present limited and outmoded facilities, but critical need for serving the newly created high-value districts, the shopping, business and industrial areas where once were fields, or at best scattered dwellings, beyond the city's fire alarm circuits.

Generally a fire alarm system of the street box type follows a fixed pattern. Wire circuits radiate from a central office containing the operational and control facilities to the city limits, and strategically located along these circuits are the street boxes.

To extend the system to cover annexed areas or new developments requires the installation of new alarm circuit cable. In many cases the existing circuits have already reached the practical limits of boxes connected, and frequently new cable must be run from the central office to the intended locations in order to provide proper service. This means that the greater part of the cable circuit length is used solely to reach the area to be protected, with only a minor section actually having boxes connected to it. Added to the cable costs quite likely will be increased maintenance expense and some budget-conscious communities will at once question it as an economy measure.



This modern control room of the Baton Rouge, La., fire alarm headquarters embodies the most up-to-the-minute facilities of radio, telephone, public address inter-com and recorders to augment the alarm telegraph system—*NBFU photo*

Decentralized fire alarm system

To integrate the new and separated high-value areas into the fire alarm system, a decentralized fire alarm service has been advanced as an economical measure. A decentralized fire alarm system is defined as one in which automatic substations are established, usually in existing engine houses. These substations serve densely populated or high value areas located remotely from the main fire alarm office. The automatic substation relays fire alarms from boxes on circuits radiating from it throughout its district. An alarm received at the substation is repeated automatically to the main fire alarm central office. Telephone alarms of fire are transmitted from the central office to the outlying districts over the same circuits that relay the box alarm to the main office.

tional advantages. Response of apparatus in the area is speeded as the alarm can be received in the engine house at the same time it is reported to the central headquarters. In case of peacetime or wartime disaster, damage to the fire alarm system can be limited to the area involved, leaving other sections of the system in normal operation. The new development can be added to existing installations either Class A or Class B. The non-interfering and succession features of the modern telegraph alarm system are retained to prevent loss of alarms.

Telephone reporting systems

The recent advent of the street telephone reporting system as a competitor of the telegraph fire alarm system has created a storm of comment. While many maintain it has not been in operation

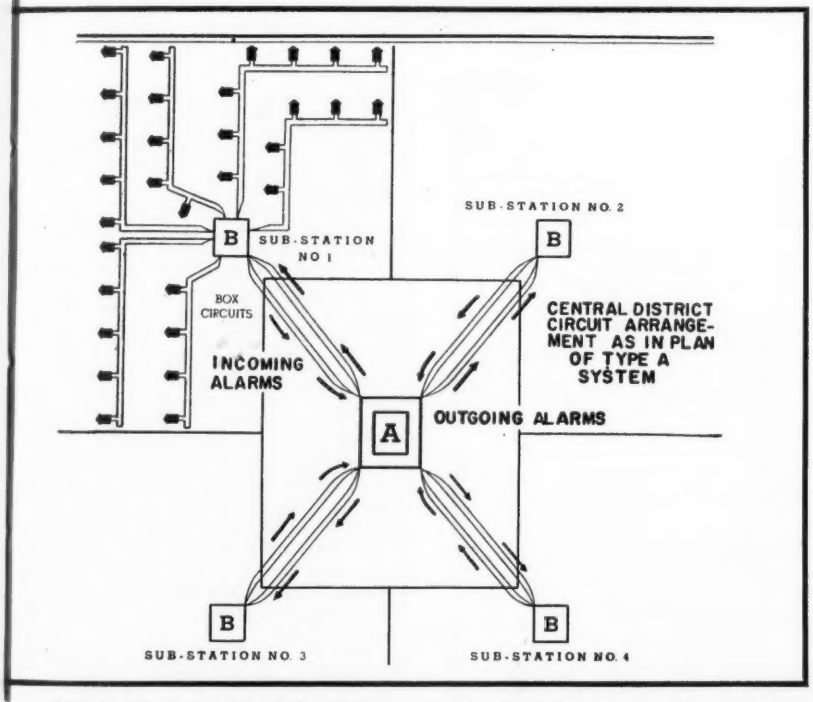


Diagram of a decentralized fire alarm system. The existing alarm circuits and equipment at "A" are supplemented by automatic sub-stations "B" as the community expands. Economy of cable plant and maintenance are advantages to be expected—*Courtesy The Gamewell Company*

One economy derived from this method is produced by the minimum cable required. The box circuits serving the remote area are run only from the substation throughout the given area. The tie-in to the central office is only a single pair, rather than a pair for each circuit as under previous practice. This usually means substantial cost reductions in both installation and maintenance.

Extension of the system is both economical and flexible. As the needs of the community require, additional substations can be tied in as desired. By this new method, box circuit lengths can be held to a minimum with resultant lower per box cost, as the result of shorter runs.

The decentralized system offers additional advantages. Response of apparatus in the area is speeded as the alarm can be received in the engine house at the same time it is reported to the central headquarters. In case of peacetime or wartime disaster, damage to the fire alarm system can be limited to the area involved, leaving other sections of the system in normal operation. The new development can be added to existing installations either Class A or Class B. The non-interfering and succession features of the modern telegraph alarm system are retained to prevent loss of alarms.

Telephone reporting systems

The recent advent of the street telephone reporting system as a competitor of the telegraph fire alarm system has created a storm of comment. While many maintain it has not been in operation sufficiently long to develop the merits pro and con, there are already efforts being made by the telephone companies to increase the efficiency of the equipment.

It is not the purpose of this study to attempt to weigh the respective merits of the two systems. Nevertheless the recent developments of the phone companies must be recorded just as we have the progress in the orthodox fire alarm box system.

One objection to the new method that has been advanced is its combined use as a police reporting system as well as a means of reporting a fire. Critics have pointed out that the extra work required in passing along police business could hamper the effectiveness of the dispatcher in a time of fire emergency. A report from one large city using this method points up the problem. On a day selected at random, 162 calls were received over the public reporting system. Of these, 160 were for police business, two were listed as miscellaneous and none was a report of fire.

In response to this criticism, the telephone companies have equipped a recent installation with "selective routing" features. A person wishing to report a fire picks up the handset in the box and is immediately connected to fire headquarters. If a policeman wishes to report, he presses a switch as he removes the handset. This automatically connects him to the police station switchboard without going through the fire alarm operator, as in previous installations. Upon completion of a call, the box is automatically returned to normal operation for fire use.

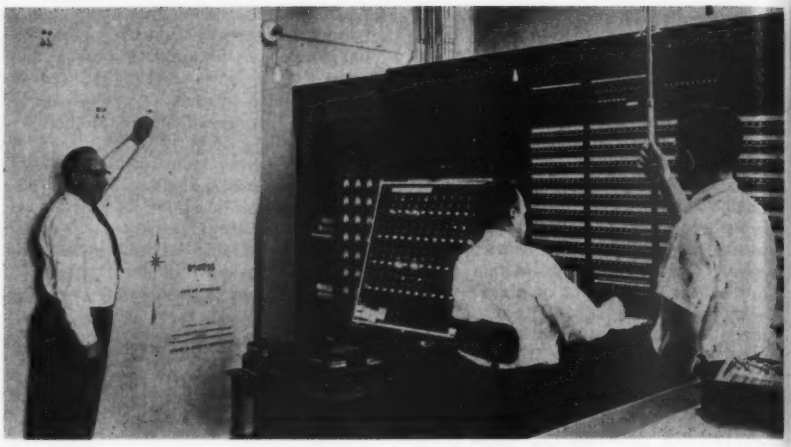
The telephone companies reportedly have also recognized the problem of cable usage for a direct line system in a large city. The size of the switchboard necessary to properly terminate all the lines poses additional operating difficulties. To overcome these drawbacks a "line concentrator" is being developed to provide the basic features of the direct line system but with a saving of cable required. By this means a large number of lines will be concentrated on a few trunks and the switchboard requirements will then be only the keys and jacks required for the trunks. The individual station number is identified and indicated on a lamp panel.

Teletype is stirring

While the teletype has been in use for some years in several departments, it has

Radio coordinated operations at the recent Wanamaker fire in New York. Both mobile and pack sets linked all sides of the extensive fire front with command headquarters. Here a fireman reports via walkie-talkie on operations from his vantage point
—*Photo by Bill Patten*

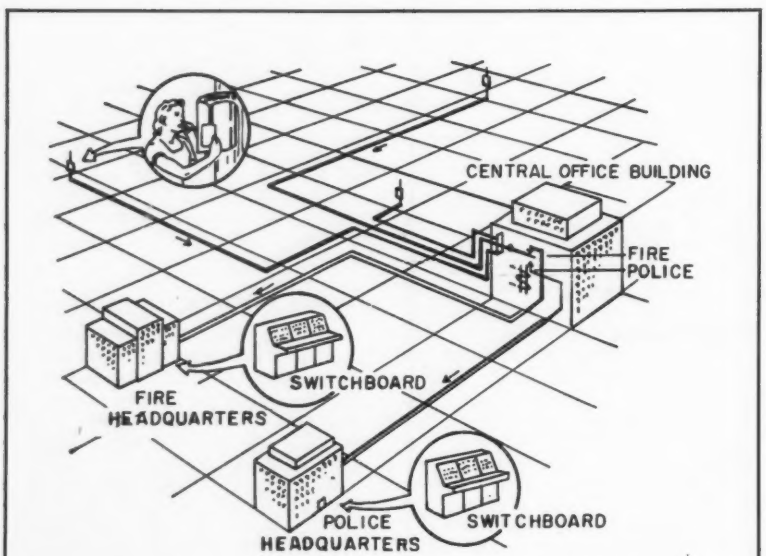
never achieved wide popularity. A few recent installations have again brought it to the attention of the fire service. It has been said in the past that the entire administration of a fire department can benefit from the use of this means of communications. General and special orders can be easily promulgated, reports received and a myriad of other functions carried on. In addition to printing the exact location of an alarm of fire, the use of the printed record reportedly assures more efficient operations and helps prevent garbled verbal orders.



The Syracuse, N. Y., Fire Department alarm office is designed for fast dispatching. Alarms are transmitted by voice over a public address system and confirmed by radio. All telephone and radio transmissions are recorded and teletype is used for general administration. The control map is a great help during multiple alarm operations

Use of radio in all forms growing

The acceptance of radio in the fire service has shown steady growth. The Federal Communications Commission reported that approvals during July, 1956, brought the total of base station authorizations granted since allocation of fire service frequencies to 3,129. Add to this figure the mobile units, auxiliary base stations, repeaters and portable units, and a solid picture of accomplishment appears. The total of authorizations does not represent the number of departments using this method. In many states, fire radio nets are established on a county-wide basis and a large number of departments may be operating under a single license. There is still much to be accomplished however, since it is estimated there are over 20,000 fire departments in this country.



The Indianapolis telephone alarm installation incorporates a special switching arrangement to separate police and fire traffic. Emergency calls are reported in the normal manner, but a police officer reporting to his headquarters no longer must go through the fire alarm switchboard—*Photo courtesy Bell Laboratories Record*

Assist in radio research

The fire service has been the proving ground for many technical advances in the radio field. The use of developmental frequencies for remote-control relay purposes is common in some areas where the control center is at some distance from the base transmitter. By making the fullest use of existing frequencies and proving their value, the fire service will have a firm foundation for any claim it may make to FCC for its rightful share when any future decisions on allocations are made by the Commission.

Tone signaling with its amazing control possibilities, has been widely used for remote siren operation. Many of the county-wide fire radio systems depend on this unique method for alerting firemen. As reported in the August, 1956, issue of FIRE ENGINEERING, some departments are now using selective signaling in conjunction with radio receivers in the homes of volunteers as an efficient, silent method of alarm notification.

Frequency sharing and its consequent congestion, has been a source of irritation to many departments. As more experience has been gained in the use of procedure and the simple expedient of living together, the complaints have dropped off. Tone signaling offers some relief from the more common problems. One of the new systems using inaudible tones with automatic receiver response, seems to provide a logical solution. Inasmuch as the receivers are in standby whenever the base transmitter is off the air, annoying transmissions from other stations on the same frequency are eliminated. In addition, as the use of radio by the fire service increases, and additional departments are granted access to the limited frequencies, more efficient use of the available air space will result.

Portable sets are popular

The fire service experiments with portable radio units date back many years. As improvements have been introduced, they have been tried out and if worth while, have been quickly adopted. Although only on the threshold of general acceptance, this portable equipment has already proved a boon to fire officers directing operations and has saved valuable time in transmitting orders and handling detail reports.

Today light-weight portables have new versatility. In the past an objection has been the short life of the battery pack. Wet-cell storage batteries were offered to overcome this, but the additional weight and corrosion problems that were inherent added new difficulties. Several methods have recently been introduced to alleviate the problems.

The addition of transistors to the portables has helped to lengthen dry battery life; an interchangeable nickel-cadmium

St. Louis, Mo., central station of a national electric protection service. The operators on duty receive and act upon supervisory signals from sprinkler, fire detection, smoke detection and burglar alarm systems in mercantile and industrial buildings. Direct lines to the fire department afford quick transmission of alarms—*Photo courtesy A. D. T. Co.*

rechargeable battery pack eliminates many of the objections to the previous wet-cell power supply. AC power can be used through connection to a power pack. In addition, the nickel-cadmium supply, at least in one portable model, contains a plug for connecting supply leads to operate the unit from a vehicle battery of either 6 or 12 volts. By merely unsnapping one power supply and connecting another, the portable can be adapted to a mobile unit or used as a short-range base station.

As we weigh the potentialities of this innovation, we learn that one of the criticisms leveled at the portable unit has been the tying down of the operator to the handset. In order for all transmissions to be heard, the handset must be held near the ear. This immobilized one man and in some cases this was considered wasteful of manpower.

The radio manufacturers met the situation by supplying the "pack set," a portable unit that could be carried on the back. This method freed the hands of the operator for other tasks and a small loudspeaker kept him informed of the air traffic at all times.

By using this equipment, larger unit size became possible, and some builders supplied a slightly more powerful transmitter to obtain greater range. In addition, separate power supplies to meet the varied needs of the service have increased the versatility. The design of the pack-type set is popular with many departments faced with brush and forest fire problems.

High power mobile units

Radio equipment for fire apparatus originally was available in only a few power output ranges. As more experience was gained in the use of mobile units, it was found that a wider range of output was required to meet the varying conditions throughout the country. Nearly all manufacturers of mobile radio equipment now offer packaged units ranging up to and over 100 watts output power. In keeping with advanced engineering, the power drain from the vehicle's electric system has been reduced. The new units afford wide latitude to an engineer in designing a system to meet the needs of a particular community.

A recent development in the receiving tube field offers promise of even less power drain on the electric system. The new tubes are designed to operate with plate voltages equal to that supplied by the standard 12-volt automotive battery. This will eliminate the requirement of a high voltage power supply and its associated parts in the receiver. At present these tubes are available for standard broadcast receivers, but experiments are being conducted to adapt them to the higher frequency bands.

As new designs were engineered, special accessories were developed to meet the conditions of the fire service.

Important progress has been made in high output alternators and generators which were added to fire apparatus to accommodate the additional loads placed upon the electrical system.

Several side effects have been observed in this category alone. The requirement of battery charging, so common before the introduction of the alternator and high output generator, has been drastically reduced in many departments. In addition, the alternator can be equipped with a transformer and an additional source of emergency lighting power then made available.

Another advance, the addition of the power amplifier to the receiver, has stepped up the audio output and enabled good reception over high ambient noise levels. The power amplifier can also be used independently of the radio unit and is effective in controlling crowds and directing firemen on the fire ground and training field. One manufacturer offers a packaged unit designed for the needs of the fire service which incorporates the power amplifier.

Some chiefs see a psychological benefit in this type of equipment. By locating one piece of apparatus near the crowd that invariably gathers at every fire, the orders given and reports received can be heard. Some officers believe this additional information, coupled with what can be seen of the fire, may help satisfy the curiosity of the crowd and keep it from the danger area, out of the way of the working firemen.

To bring the benefits of the power amplifier to equipment now in operation, a new "transistorized speaker" has been introduced. A power amplifier, using transistors, is built into the metal case of the speaker, and by connecting to the mobile unit, outputs of up to 15 watts audio power can be obtained with a 12-volt mobile radio. The speaker can be easily removed from its mounting bracket and hung on the door of the apparatus or in any position convenient for use.

Modern microphones

Noise-canceling microphones have been widely used in the armed forces for some time in areas where severe noise levels affected communications. In many cases, the use of this style of microphone has meant the difference between clear transmissions or none at all. This microphone in a modified form has been available for several years and may be the answer to noise problems when pumping or during response.

A second type of microphone designed to overcome the noise problem has recently been introduced. The highly efficient transistor is employed and an amplifier is built into the microphone case for boosting the voice signal level. One variation of this microphone combines the features of the "mike" and loudspeaker. In addition to its use as a conventional microphone, it can also be held close to the ear for receiving messages in noisy locations.

Emergency power units

Over the years, disasters of different kinds have alerted fire departments to the need for standby emergency equipment for use in the event of power failure. Today emergency power generators are finding acceptance by the fire service to automatically take over the power supply load in time of commercial failure, both for central fire alarm station application and for remote radio control operations.

Originally these units were gasoline-powered with all the drawbacks of gasoline storage. As remotely located and operated radio base stations became more common, liquefied petroleum gas became a popular fuel. It is reported that in areas where natural gas is commercially available, generator engines have been equipped with carburetors to use this unique fuel.

Future electronic possibilities

It is in the field of radio and electronics that lie the greatest opportunities for sci-

Continued on page 978

The ability of the modern centrifugal pump to deliver large volumes of water at high pressures was demonstrated at the recent Wanamaker fire where 23 modern 1,000 gpm units took the place of the former high pressure system—*Photo by Bill Patten*

The Centrifugal Fire Pump Goes "Up-Stage"

—And More Power to It, Says the Fire Service

By DONALD M. O'BRIEN

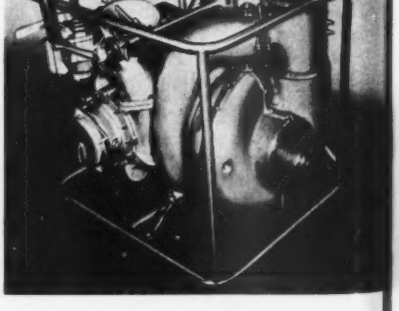
THE ADOPTION OF THE CENTRIFUGAL PUMP for almost universal use on fire fighting equipment has been one of the most interesting and illuminating phases of the development of modern fire apparatus. From the booster-tankers to the heavy duty high-pressure metropolitan pumper and fire boat, the centrifugal serves them all and has proved its merit in long, hard usage.

A centrifugal pump is a high speed device and in its early beginning the impellers had to be quite large in order to obtain sufficient rim speed to develop the required pressures. At the time of its introduction to a somewhat skeptical fire service, the driving engines were of a comparatively slow speed, and 750 rpm was considered a normal range. But over the years, with the improvements in motor design and the trend toward the high speed engine, it was possible to reduce the size of the impellers and with it the over-all bulk of the pump. It is worthy of note that at the same time, the efficiency curve of the centrifugal fire pump has paralleled the upward extending speed curve of the automotive power plant.

Engineering advances

The introduction of the pressure-volume type of pump has made possible the raising of the operating pressure ranges to 500 or 600 psi when full volume is not required. Coincidentally, this reduced the required engine speed necessary for the higher pressures to that easily met by the automotive engine. As a net result of all the various progressive developments, the increase of volume obtainable at the higher pressures has led in recent years to a new standard of pump classification. This result is attested by the fact that only a few months ago the NFPA-IAFC Committee on Fire Apparatus voted to drop the old classification of "Class B" entirely and standardize on the "Class A" specifications for future fire pump performance.

Portable gas turbine-driven pump developed for the U. S. Navy now being used in forestry and other service. Measuring about 2 feet in each dimension, it produces 500 gpm at 100 psi. The gas turbine develops over 45 hp at speeds in excess of 40,000 rpm —*Photo courtesy Solar Aircraft Co.*



Fire fighting needs influence progress

Fire fighting methods have both influenced and been influenced by the centrifugal pump. In the days of dependence on the hydrant hose line, it was a common practice for the water department to raise the street water main pressure (not to be confused with high pressure fire mains) to enable firemen to obtain effective streams. With the introduction of the early steamers this practice began to be discarded. Instead, the fire service provided its own working pressure as desired by hooking up pumps. The positive displacement pumps, off-shoots of the steam age, due to their nature, could not make effective use of the pressure at which the water was delivered from a hydrant. However, the centrifugal, as it found its place in the "gasoline era," could add its capabilities to the pressure received from the mains and, theoretically at least, produce a pressure that would be the sum of the hydrant pressure and the pump pressure. This advantage meant less effort on the part of the driving engine and the pump, with the possibility of longer usable life for both.

As one reviews pump developments, it would appear that the more compact size of the modern pump has resulted in another attribute permitting better use to be made of the chassis space. The earlier pumps, because of their bulk, limited the amount of equipment that could be carried on a given unit. At one time it was thought that the use of more compact pumps would result in smaller apparatus. But the trend has been in just the opposite direction. As smaller space was required for the pump, the fire service began devising new methods of operation and the space obtained has been used for a variety of purposes—to enlarge booster tanks, increase hose loads, or for more compartmentization. At the same time the ease of handling the apparatus while underway has been improved.

The "fast attack" method of fire fighting, so popular today, has primarily been made possible by the progressive operating features of the modern pumper. The use of preconnected lines, with the required piping and valving so necessary for quickly getting into action, is now a common practice. Booster lines have been preconnected since their inception, but have been limited in volume and effectiveness. As larger water tanks were mounted on apparatus—to a great extent made possible by modern pump developments—the use of the 1½ inch hose line became more practical and it was quickly pressed into service.

Apparatus design changes follow

The progress in fire fighting methods and pump design has led to many progressive changes in fire apparatus. The modern pumper of today may bear some slight resemblance to its predecessors, but a close look will disclose many differences. At one time, suction connections were found on opposite ends of the pumps. These connections were of a single size to accommodate the hard suction hose carried on the apparatus. Today, front and rear suction connections in addition to the side connections are common, and no one will gainsay their advantages.

The use of previously mentioned preconnected lines, and the more extensive employment of relay operations has brought with it the 2½-inch suction connection equipped with gate valves. Where hydrant supply lines are used in the quick-attack methods, the gated suction connection has eliminated the loss of time associated with attaching heavy adapters.

Discharge gates in the past were seldom found at any location other than on or near the pump panel. With the change in methods, the need for more convenient placement became apparent. Today, rear and top discharges are common on many pumpers and all valves for the remote gates are controlled from the operator's panel.

Valve design improved

To obtain the operating speed and ease necessary for the modern conditions it was imperative that control valve action be improved. To meet this situation the quick-action quarter-turn valve has been perfected to a point where anyone can operate it when under pressure. No longer must the pump operator shut down his pump to relieve the pressure when opening a valve. Nor is it necessary to resort to the mallet or other "persuader," (sometimes contrary to standing orders) to open a gate without shutting down.

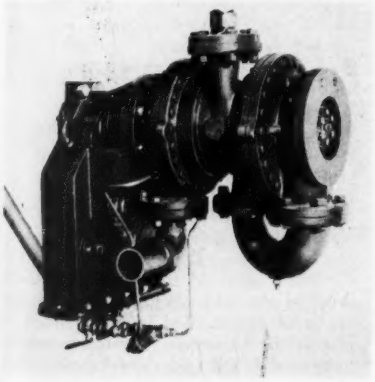
The addition of friction-locking devices to the new valves has brought even greater flexibility to the modern pumper. By means of individual pressure gauges for discharge gates, the operator can now supply a different volume of water to each line as desired. This has resulted in greater efficiency and safety for the hosemen, no mean attributes.

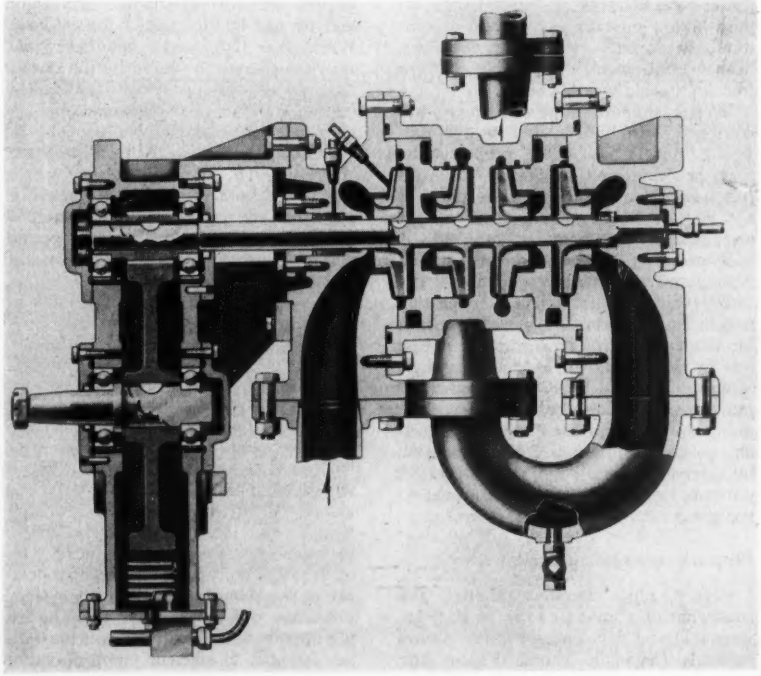
The advent of the quick-action valve has inspired style-conscious apparatus designers to make further attempts to clean up the exterior appearance of the operator's panel. The easy action of the new valves has allowed flush mounting, or the enclosing of the valve housing back of the panel, with only the coupling and

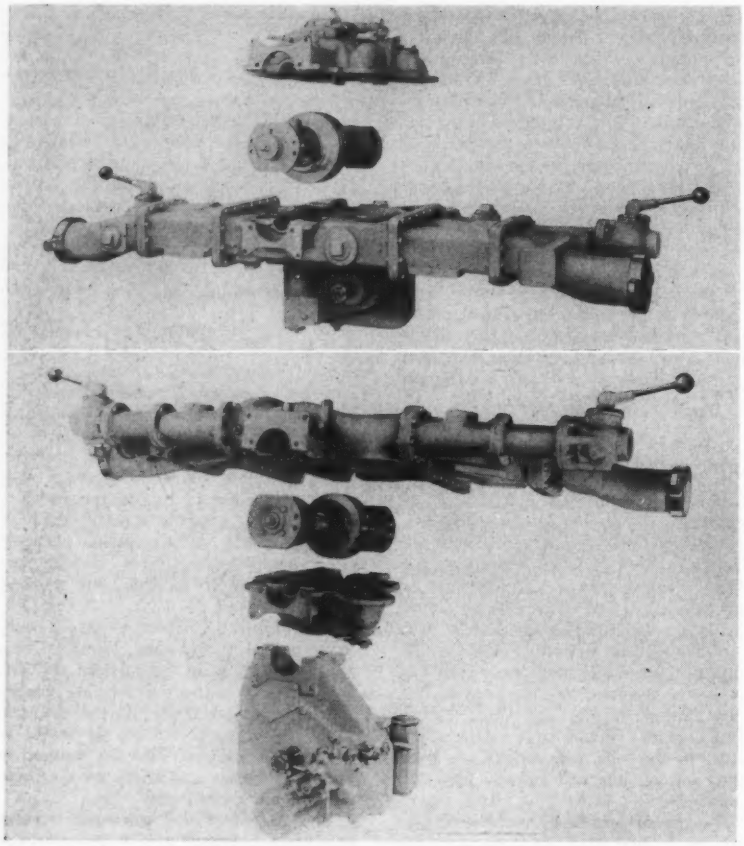
Below: Exterior view of one of the latest 4-stage high pressure centrifugal pumps. The compact auxiliary pump may be driven from the apparatus power take-off or skid-mounted with a direct-connected driving engine

Right: Cross-section view of a centrifugal high pressure pump. Only one manually-adjusted packing assembly is used in this style, simplifying maintenance; the front end bearing support of the impeller shaft is a special alloy bronze

Photos courtesy American LaFrance Corp.







Exploded view of a centrifugal pump designed for easy mounting on any chassis specified. The main pump case assembly can be inverted to raise or lower the operating parts depending on the frame and engine mounting requirements. All main controls are electric-powered and the pump shift is a unique adaptation of a 2-speed rear axle control

—Photo courtesy Waterous Co.

the control handle or rod exposed. Recently one manufacturer introduced the power-controlled valve which, with its push-button operation, may add to this trend. In addition to the artistic values, flush mounting may also help prevent freezing in cold weather areas.

Many pumpers delivered today are equipped with built-in systems for supplying turret nozzles or proportioning foam or water wetting agents. While direct connection of turrets to the pump is not new, a more versatile and efficient arrangement can now be supplied. A pressure gauge is connected to the supply piping and mounted directly above the turret valve control on the operating panel. By measuring the nozzle pressure for the various tips during tests, friction loss in the turret can be determined. A simple chart may be prepared from the pitot readings for future reference. A pump operator can then supply any discharge required for a given operation by referring to the chart and setting his pump to produce the required reading on the gauge.

Proportioners popular

Proportioning systems, although still somewhat of a mystery to some skeptics, were a logical development in fire control methods. Originally, chemical foam with its separate additional equipment, was the only type of foam agent available. Experiments with mechanical foam liquid and its use by the armed forces during World War II opened a new field which was immediately explored by the civilian fire service. The possibility of quickly getting into action with foam appealed to many chiefs, and it was not long before foam tanks were being installed on apparatus. The same is true of wetting agents. Manufacturers report many departments are ordering built-in systems, some of which are dual-purpose, permitting the use of either foam or wetting agents.

Development in operating panels and priming

One of the apparently incongruous developments in the associated parts of fire pumps is the operator's control panel. The earlier antecedent of today's gasoline-powered products were equipped with a minimum of indicators, levers and gauges. Compared with these venerable models, the modern conception, which in some cases resembles the control panel of an airplane, may be a bit disconcerting to the pump novice. But second consideration will indicate that these operating appendages, if we may use the term, are essential to efficient pump operation.

In order to take advantage of the full flexibility of the modern pump, and the accessories available, controls are necessary. By grouping all these controls at a central point within easy sight and reach, the task of the pump operator naturally is simplified. Before the days of remote control, the operator was required to walk around the apparatus to open or close valves, as required. Today, the same results are obtainable more quickly and without the operator leaving his position. Individual gauges tell the operator the conditions of his equipment at a glance, and with all controls near at hand it is a simple matter for him to meet the varying conditions which may be called for by the situation. The future may witness even more radical developments in this field of design.

One of the problems connected with operating centrifugal pumps is priming failure. Many times this failure is traced to an open drain valve and checking the source of the air leak is frequently an irritating and time-consuming task. On the older models of apparatus, drain valves are often found underneath the chassis and add to the operator's frustration.

Some manufacturers now equip their pumps with a central drain valve, piped to the required locations, and controlled by a single lever on the operating panel. This allows a quick check to be made for possible trouble when beginning draft operations, as well as a positive drain of all points when shutting down.

Power operated controls

One of the minor controversies that is presently raging in the fire pump field revolves around the question of automatic controls. In the past some operators have complained about the multitude of levers required to control a centrifugal pump. In an attempt to overcome this objection and at the same time obtain smoother operation, manufacturers turned to power-assisted controls.

While many of these controls have been in operation for a number of years and have proven themselves in service, a few are recent innovations. Alarmed by what might be a trend to "gadgetry" one Underwriters' authority cautioned field engineers to be on the lookout for "unnecessary" power controls when conducting acceptance tests. One manufacturer of fire pumps supports this thinking in these words: "We do not believe in (power) controls for their own sake. To our mind, a control becomes a gadget when it does not have a real advantage. Real advantages would be greater reliability, quicker and simpler operation and a reduction in maintenance cost." On the other side of the controversy this warning is sounded by the chief engineer of one the leading apparatus manufacturers in these words, "The present trend is to more application of power to controls. Some organizations are becoming concerned about the added complication of these controls and are demanding proof of reliability. While these agencies are to be commended for their efforts to protect the fire service, too many restrictions tend to stifle new developments."

High pressure pumps

As changes in methods have occurred, pumps have been adapted to keep pace with the trends. With the introduction of the high pressure method of water fog production, changes in pump design were introduced to accomplish the desired mechanical results. At one time the piston pump had been practically counted out of the pumper apparatus picture, but its return in the high pressure field has been welcomed in many quarters. It has proved to be a capable performer and is giving excellent service. It was a natural development that the centrifugal pump should emerge in several new designs to meet the requirements of the high pressure field.

Some pump manufacturers have added a third stage to their volume pumps and an additional control to give the operator a choice of discharge. Another has designed an entirely new pump that offers a selection of volume, standard pressure ranges or high pressure in a single package.

A third type unit is the small, auxiliary, multistage centrifugal pump designed to be operated from the apparatus power take-off in a similar manner to the piston style. A newcomer is a multistage auxiliary that is capable of supplying high-pressure requirements as well as producing volumes necessary at conventional pressures for booster pump service.

These features enable the use of this pump as a booster on apparatus where necessary. In addition to its ability to supply conventional and high-pressure booster lines, it is capable of supplying 1½-inch lines. The pump may be mounted on standard pumpers, squad trucks or ladder trucks for this service. It can also be mounted with a separate engine drive as a skid unit for operation completely independent of the chassis. This feature may appeal to departments which require a pump unit of this nature for grass and grain field fires, or brush fires.

Protection features

Due to the nature of high-pressure service, it is very important that certain mechanical protection features be incorporated in the design of the complete pump package. One such automatic feature in the new centrifugals is cooling of the pump transmission oil. Whenever water flows through the pump, a portion of it will flow through a cooling coil in the bottom of the transmission case. This action reduces oil oxidation, foaming and loss of viscosity.

Pressure relief in the high-pressure system is necessary to prevent heat build-up when the nozzles are closed. All systems use relief valves set at the factory for normal operation. If higher pressure relief is necessary, a manual adjustment can be made. Some centrifugal pumps provide a small amount of continuous by-passing as a further precaution. In all of the pressure-relief systems the by-passing action is from the discharge of the pump direct to the water tank, rather than to the suction side of the pump as in the case of conventional volume pumps. This is done to take advantage of the greater cooling action possible and tends to keep the water within safe limits.

Future looks promising

As history of the fire services discloses, fire apparatus pumps and related accessories have shown a gradual improvement over the years, keeping pace with the advancements in fire methods and manufacturing. The progress has been constant but not spectacular as is typical of a service where tried and proven performance is necessary.

In recent years however, certain experiments have been carried on in the automotive and pumping fields which may foreshadow important future developments in the fire service.

The use of gas turbine engines for propulsion has been studied and tried out in the automotive and truck fields. With the possibilities of fantastic rpm's from these engines, perhaps the volume pump of the future may be of a size comparable with the present portable. The U. S. Navy already has procured a gas turbine-driven pump measuring about two feet in each dimension complete, which produces a volume of 500 gpm. In this pump the gas turbine speed exceeds 40,000 rpm's.

Turbine-driven pumps are finding their way into the public fire service. Many predict continued progress will be made in the entire field of portable pumping equipment beyond the adoption of high speed units. This progress will almost certainly result in devices delivering still greater gallons-per-minute at fewer weight-pounds-per-horsepower. Not only will the forestry service encourage such developments but such pumps will possibly find broader applications in disaster and civilian defense operations.

The extensive exploration being undertaken into the combustion of fire, and its extinguishment by waterfog, fog-foam and wetting agents, cannot help but have repercussions in the field of pumping equipment.

There will undoubtedly be even more important developments in major pumping apparatus. Exploration of the broader application of large-scale pumping units, up to as high as 3,000 gpm, may be expected in concert with the revised and improved strategy of fire attack whereby greater use is made of water supplies nearer the fire.

In the area of auxiliary pumping equipment, we may see the paradox develop whereby pump controls may increase in

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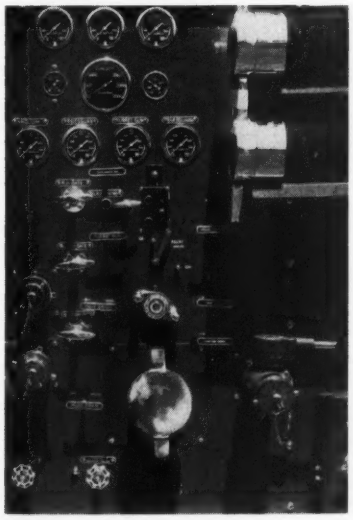
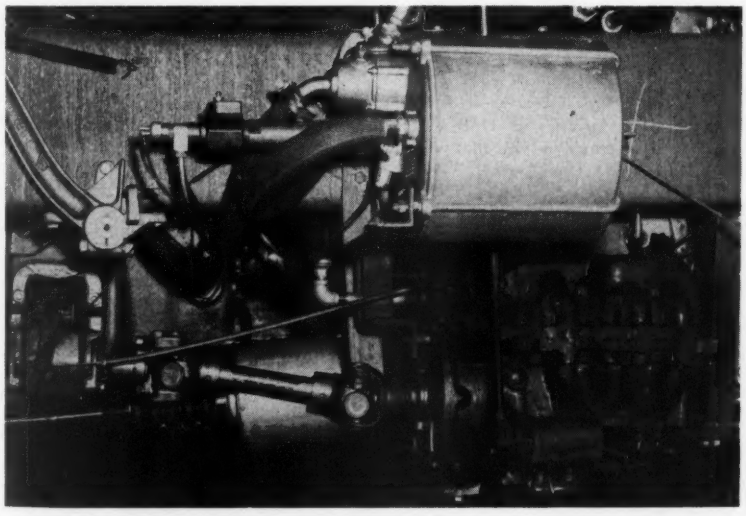
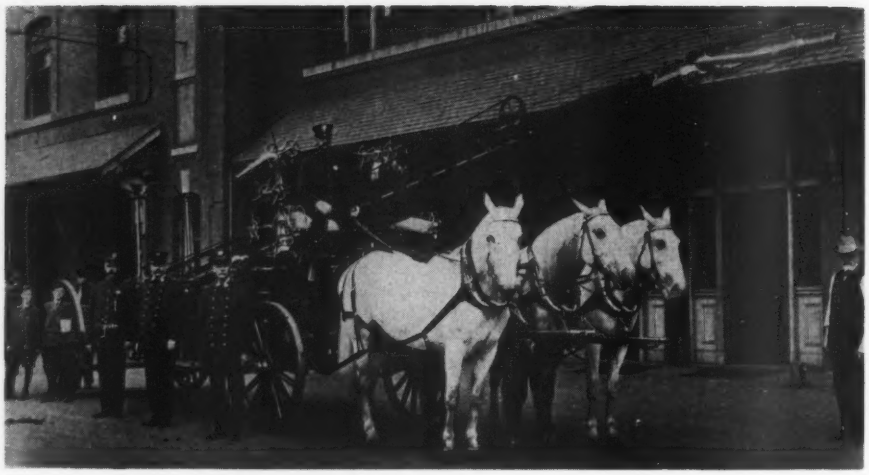


Pump panel of a modern fire truck equipped with both electrical and mechanical controls. Flush-mounted discharge valves are controlled by convenient handles and individual pressure gauges record the discharge pressure in each line. A separate control and gauge is provided for the turret gun —*Photo courtesy Ward LaFrance Truck Corp.*



Under-chassis mounting of a modern centrifugal high-pressure pump. The drive shaft is connected to the power take-off of the vehicle transmission by means of universal joints. The large tank directly over the auxiliary pump is the vacuum power unit for the main pump transmission control—*Photo courtesy The Seagrave Corp.*



Rochester, N. Y., boasted this early Champion tower with its handsome three-horse hitch. This unit was later replaced by a Hale tower which, in turn, was wrecked by falling walls several years ago and cut up —*Photo courtesy Rochester Fire Bureau*

The Rise and Decline of the Water Tower

Is another famous fire fighting facility to pass into history? This nostalgic account would indicate so—in the name of Progress!

By CLARENCE M. MEEK

Honorary Battalion Chief, New York Fire Department
Librarian, Fire College

A STORY WRITTEN a few years ago of the Great Fire of 1871 in Chicago, included description of an apparatus which was referred to as the first water tower. One of the drawings which illustrated the narrative gave the artist's conception of the appliance and showed an elevated platform mounted on a vehicle, from which two men were directing streams into second story windows. This was definitely not a water tower as we think of the apparatus and the units—there were two of them—were designated in Chicago Fire Department annual reports of the period as "Hose Elevators Nos. 1 and 2," stationed on Marrison St. near Pacific Ave.

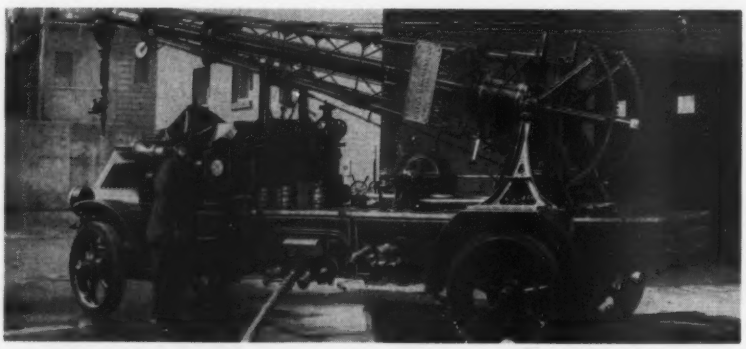
We mention the hose elevators only to reject the idea that water towers were in existence in 1871.

While the Chicago conflagration may not be important as part of this history, we know that the Great Fire had a tremendous impact on the American fire service and possibly some of its lessons inspired Abner Greenleaf, of Baltimore, to think of the need of devising means of putting water on fires which could not be reached by streams projected from the ground. Buildings were already reaching such heights without anyone having thought of interior standpipes. One chief engineer had written a paper advocating a system of permanent ladders and piping on the outside of structures so that hose could be carried up and attached to outlets at different levels, and it may be that contemplation of this idea turned Greenleaf's thoughts to a portable standpipe which could be raised high enough to project an effective stream to the top of the highest buildings of that period.

First water tower

Whatever his inspiration, Greenleaf and a mechanic employed by him, designed an apparatus which was described in the patent application as "a portable standpipe, or water tower." Patent 184,534 was issued to the mechanic, John B. Hogan, and a half-interest was assigned to Abner Greenleaf, who financed the building of a sample apparatus. This was the first water tower.

Without waiting for the world to beat a path to his door to buy this "better mouse trap," Greenleaf loaded his apparatus on a railroad car and took it to the metropolis which he considered his best prospect and on June 14, 1879, demon-



San Francisco, Cal., still has Gorter 35-foot water tower as well as a 65-footer. Note unique ball-bearing swivel with mast nozzle and electric lamp on nozzle—*San Francisco F. D. photo*

strated the "portable standpipe" to the fire commissioners and Chief of Department Eli Bates, in New York. The officials were much impressed and interested, but had no appropriation which could be used for the purchase of the apparatus. Undaunted, Mr. Greenleaf offered to turn the tower over to the department for trial in actual service, the trial to continue for an indefinite period without cost to the City, or obligation to purchase.

The offer was accepted and the tower placed in service with Engine Co. 7 on July 1, 1879, by Special Order 16, of that date:

> "A portable Water Tower, for the purpose of delivering an effective stream of water in the upper floors of the buildings that cannot be reached with ladders, had been placed on trial in the Department by the owner. It is now ready for use and located in the quarters of Engine Co. No. 7."

The tower was assigned to respond on all first alarms below Canal Street, and a signal was established for calling it to other locations when required.

Bank Street fire provides test

The first opportunity for a real test involving a large area in the upper floors of a building came on Nov. 8, 1879. We quote from a news report of the day:

> "At the fire in Bank Street the water tower was brought into actual service, being raised to a height of 50 feet and a 1½-inch nozzle attached and the lines of Engines 3 and 19 connected to it. It had a perfect sweep of the fourth and fifth floors, and threw an effective stream over and on the roofs of the adjoining buildings. Everyone in the vicinity appeared perfectly astonished and admitted that it was the greatest thing they ever saw, and a valuable auxiliary to the fire service. The universal verdict was that a new and important apparatus for the extinguishment of fire had been added to the equipment of the Department."

Funds for the purchase of the tower were included in the 1881 budget, and so after a trial of more than a year and a half, the Commissioners paid $4,000 to Greenleaf for his apparatus. The first tower proved so satisfactory to the department that the commissioners included funds for another in their 1882 budget. Only three of the Greenleaf towers were built, the third one being sold to Boston, where it was put in service March 20, 1882.

The tower mast of the Greenleaf apparatus had to be put together in sections of several lengths of pipe to secure the required elevation and then manually raised by means of two cranks and gears engaging a trunnion. Assistant Fire Marshal Charles S. Petrie of the Chicago Fire Department, and the department's shop foreman, John Ashworth, thought that this method could be improved and worked together to design a telescopic tower, on which they took out patents. They constructed one of their machines for Chicago about 1883 and made arrangements with E. B. Preston Co., an apparatus manufacturer of Chicago, to build and sell the apparatus, which Preston advertised in *Fireman's Journal* as the "Petrie Ashworth Patent Telescopic Portable Water Tower." There is no record that any were sold.

Hale telescopic tower

At about the same time Chief George C. Hale, of Kansas City, designed a telescopic tower which was raised by hydraulic power and on which he secured patents. *Fire and Water Engineering* reported on December 8, 1886:

> "Probably the simplest and most practical water tower yet invented has just been brought out by Chief George C. Hale, of the Kansas City Fire Department. E. B. Preston & Co. is closing a contract for exclusive right to manufacture these towers and are hard at work perfecting plans for placing the tower on the market."

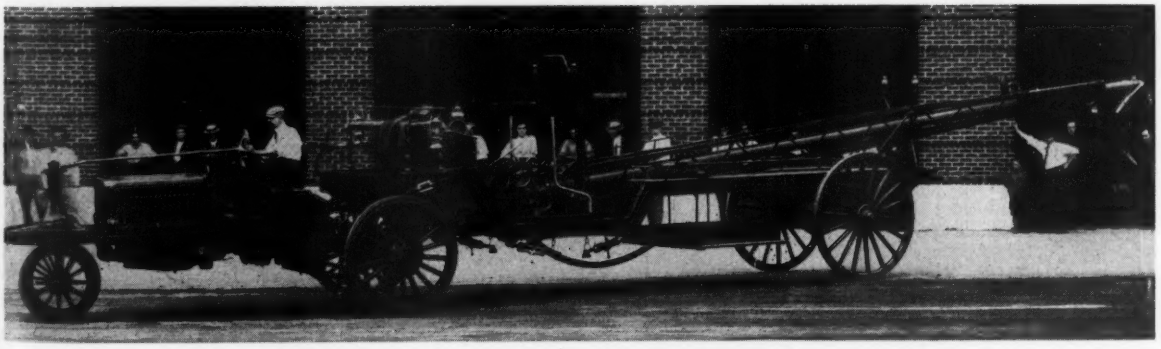
This report and date do not reconcile with the records of the New York Department which show that a Hale tower was purchased from Kansas City Supply Co. in 1885.

With this selection of a Hale tower by the New York Fire Department, Abner Greenleaf gave up his venture into the fire apparatus field, having failed to recover the investments he had made. In 1886 he assigned his latest patent to Fire Extinguisher Mfg. Co., of Chicago, who enter our story as builders of both the Champion and Hale towers.

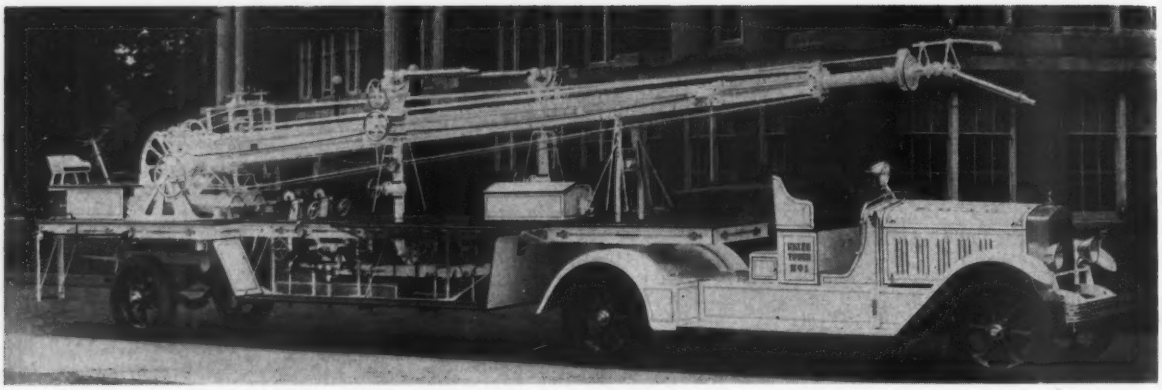
The tower mechanism designed by Chief Hale was used, without important changes in the basic design, in a majority of all tower apparatus subsequently built. The Hale principles and structural features were incorporated in the tower built in different periods by Kansas City Supply Co., Fire Extinguisher Mfg. Co., International Fire Engine Co., American LaFrance and Seagrave.

The manufacturer who did the most to develop the water tower and promote its sale in the days of horse-drawn apparatus was Fire Extinguisher Mfg. Co., one of the larger builders, although not engaged in the steam fire engine field. One of their products was the popular Babcock aerial ladder truck which had

Memphis, Tenn., bought their tower in 1898. It was tractorized in 1918 and rebuilt in 1938 with crows nest capable of holding four men. It has connections for 22 hose lines



Springfield, Mass., had this Champion tower with Knox-Martin tractor. The hand-cranked model was powerized in the early 1900's, but although the horses went, the old driver's seat remained



Jersey City, N. J., received one of the last of the water towers. This model, Water Tower No. 1, was by American LaFrance. Note tiller and seat. This city has white fire apparatus

a ladder raising mechanism employing a vertical worm screw at each side of the ladder base and manually operated by two hand cranks and bevel gearing. Fire Extinguisher Mfg. Co. used the Babcock raising mechanism design in a water tower which they developed from the basic principles of the Petrie and Ashworth tower apparatus. This new tower, which was named the Champion, had the base of the tower at the rear with the mast extending out over the horses. Not having the hydraulic raising cylinder complications of the Hale apparatus, the Champion design was simple and quickly secured a wide acceptance. The first Champion tower was built for Chicago at contract price of $5000. Brooklyn bought a Champion in 1893 and others were built for Cleveland, Detroit, Newark, Indianapolis, Toledo, Rochester, Washington, Buffalo, Springfield, Mass., and Pittsburgh. Our list is probably not complete but will give an idea of the widespread use of the Champion. All of these towers were constructed as horse-drawn machines but most of them continued their active careers until the days of motorized equipment. The Springfield unit was tractorized with a Martin three-wheeler and the Toledo Champion had a Christie tractor put under what had been the rear end of the horse-drawn machine, making it a very strange looking contraption.

Hale towers purchased by several cities

The Fire Extinguisher Mfg. Co. was licensed by Chief Hale to use his patents and designs and began the building of the Hale towers in the early nineties, being then in position to offer both the Champion and Hale types. Several cities, among them New York, Boston, Philadelphia, Baltimore, St. Louis, Cincinnati and New Orleans purchased two or more Hale hydraulic towers, and single units were built for San Francisco, Omaha, Kansas City, St. Paul, Louisville, Milwaukee, Atlanta, Oklahoma City, Syracuse and other cities. Not all of these were sold by Fire Extinguisher Mfg. Co. The Gleason & Bailey-Rumsey Branch of International Fire Engine Co. was also licensed by Hale and constructed some of the units. One of the Hale towers still used in New York was built by International in 1904.

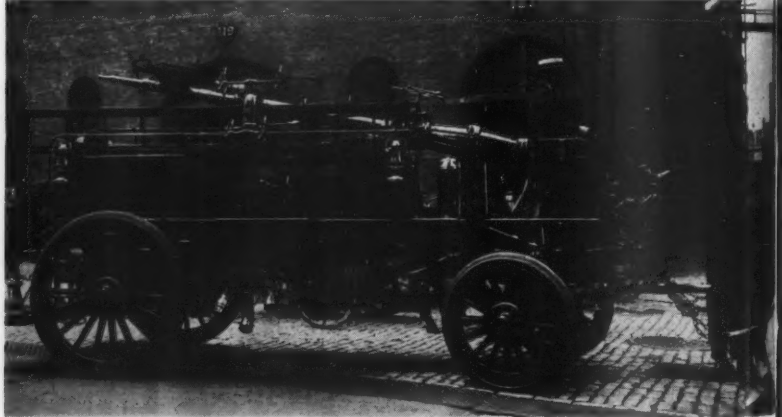
A most unique and practical design of water tower apparatus was constructed in 1903 for Pittsburgh and assigned to Engine 19, then on Water Street in a house with Engine 1. This was a combination tower, hose and turret wagon, carrying a 25-foot water tower, two large deluge guns and 1000 feet of 3-inch hose, plus the standard equipment of an engine company tender in a high value district. Later a second unit was bought and assigned to Engine 46. Originally drawn by three horses, these machines were tractorized by American-LaFrance and were slightly modified during this rebuilding. The deluge wagons had a great record of service in Pittsburgh and were a most useful and practical type of equipment. The only other one of the kind we have seen was in Atlantic City.

Champion Pneumatic tower

Fire Extinguisher Mfg. Co. were also responsible for the designing of a revolutionary apparatus which they called the Champion Pneumatic Aerial Ladder Truck and Water Tower, and which is illustrated herein. The power for elevating and extending the ladder tower of this forerunner of our modern aerial-tower apparatus was stored compressed air, a method first used on the Kaiser Pneumatic Aerial and developed into a widely used ladder hoist for horse-drawn aerials, by Chief Dahill, of New Bedford. Fire Extinguisher Mfg. Co. did not succeed in putting over the Champion Pneumatic but it is a most interesting link in the history of the water tower.

San Francisco purchased its first water tower, a 65-foot Hale, in 1891 and put it in service at 50 Sacramento Street as Water Tower No. 1. A mechanic named H. H. Gorter, with inventive talents, and who was employed at the Corporation Yard, the fire department shops, thought that the Hale tower could be improved and worked out designs for a distinctive type of mast to be raised by a water motor, instead of hydraulic cylinders. He used a solid connection between the intake manifold and tower pipe, instead of flexible hose, and also designed a ball joint, swivel type of tower and monitor battery nozzle.

Gorter was authorized to build a tower according to his designs and this was completed and placed in commission in 1898. Another Gorter tower, of 76-foot elevation, was also constructed at the shops in 1901. Later these units were tractorized and are still in service as Water Towers No. 2 and No. 1 respectively.



Before: Early combination hose, turret and water tower wagon, built by Fire Extinguisher Manufacturing Co. of Chicago for Pittsburgh, Pa.

When the San Francisco Department was placed on a full-paid basis in 1900, Gorter was appointed Captain and in 1906 was designated Acting Chief of Battalion. On his retirement in 1910, Captain Gorter was employed by Los Angeles to supervise the construction of a tower of his design for the Los Angeles Fire Department.

In 1927 the Gorter principles were used in constructing two 50-foot towers on short wheel base chassis for the San Francisco Department. These were built by Union Machine Company. The four San Francisco towers are in reserve service and are special-called when needed. All four units are equipped with monitor batteries and carry tips from 1½-inch to 2½-inch diameter.

Spring-assist principle applied

The first tower with manual spring-assist raising device was built for New York City by the Seagrave Company in 1907. The spring-assist principle was applied to tower apparatus with such success that most of the water towers subsequently built were of this type and three of the hydraulic towers in the New York Department were converted to manual spring-assist operation. Both American-LaFrance and Seagrave used the mechanism on tower apparatus constructed for Birmingham, Chicago, Detroit, Jersey City, Newark, Providence, St. Paul, Washington and possibly others.

None of the horse-drawn towers of which we have pictures shows an arrangement for steering the rear end and the tiller seems to be an innovation of the motor age. With the exception of the unit built for New York City, the Seagrave motorized towers are of the four-wheel type without tillers, and of the reversed-mast model, with the base of the tower at the rear. Several horse-drawn units which were tractorized had tillers installed at the time of conversion. The motor-driven towers constructed by American-LaFrance have been of both front-to-rear, and rear-to-front mast types, tractor-drawn. Also some horse-drawn converted units were reversed when tractors were put under them.

Basically, the latest towers built more than 20 years ago were the same as the first design of Chief Hale. There were improvements such as spring-assist raising mechanisms, the intermediate mast nozzles with which many of the later units are equipped, and the "crows nests" on the Chicago towers, but the general appearance of water towers has remained as designed 60 to 70 years ago.

A unique application of the water tower was made on an apparatus built for Los Angeles by American-LaFrance, according to the ideas of Chief Ralph Scott, a most progressive officer who never hesistated to depart from the conventional in designing apparatus to meet the specific needs of his department. This unit was a combination tower and city service ladder truck, employing a conventional tower mast and carrying assortment of ground ladders and ladder company equipment. No water tower ever wore out from overwork and Chief Scott wanted a unit which could be useful at the average response in the high value district and quickly available if needed for tower operations.

The first Greenleaf tower was originally fitted with a 1½-inch fixed tip but after some experience the New York Department added a third inlet and substituted a pipe with removable tips from 1⅜ inches to 2⅜-inch diameter. A deck-gun was also installed and furnished with variable tips up to 2-inch diameter. As 2½-inch tips are still being used as maximum size it appears that there has not been any material change in the capacity ratings, except that some later units are equipped with intermediate tower nozzles and multiple deck guns. Individual stream discharges remain about the same.

Ladder pipes for use on aerial ladders were introduced in the 1880's and advertisements of the Hayes aerial as early as 1885 feature the use of the aerial ladder as a water tower. Pipes for permanent attachment to the rungs of the ladder were furnished by Morse, Callahan, Eastman, M. H. Hart, and others. New York conducted a test of a ladder pipe on May 25, 1894, the demonstration being made with the 75-foot Hayes Aerial of Ladder Co. 14, at 125th St. and the Harlem River. The test was pronounced successful by Chief Hugh Bonner but in view of the fact that New York then had three water towers in service and the ladder pipe was limited in its capacities and applications, the chief did not recommend its adoption. More than 40 years later, in 1939, New York fitted several 85-foot wood ladder spring-hoist aerials with fixed ladder pipes for service in areas remote from water tower companies.

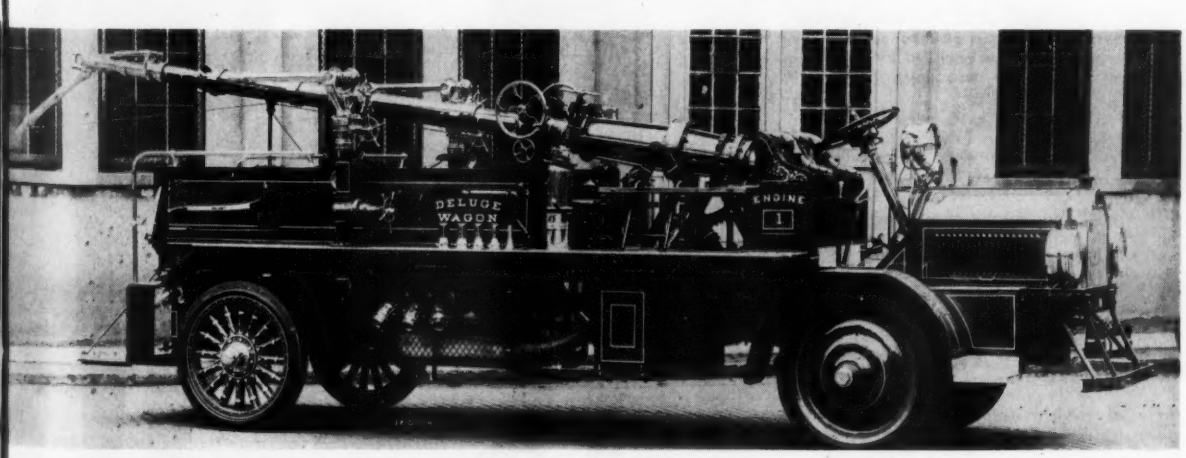
Ladder pipes were used by a number of fire departments on horse-drawn aerials but they were not considered a replacement of the water towers in the larger cities until their limitations were largely removed by the successful application of power-operated ladder structures to motor-driven apparatus. The doom of the water tower was decided when metal alloy ladders were offered by several manufacturers in place of traditional wood.

Decline in 1930's

The "roaring twenties" saw the construction of the last apparatus of the conventional water tower design, and the panic-inspired economy days of the 1930's witnessed the beginning of the decline of the separate water tower unit as standard equipment of the fire service in our larger cities. During the 77 years since the first Greenleaf was constructed, 103 water towers were sold to American cities, the last one 25 years ago.

When New York City put one of its towers on the auction block recently, one of the bidders was a Long Island collector of ancient vehicles who wanted it for his museum. And so the water tower takes its place alongside the steam fire engine as a collector's item!

Acknowledgment: The author gratefully recognizes the assistance of the following in the preparation of this report: Joseph C. Connell and Brian Thompson, Phoenix Society, San Francisco; FIRE ENGINEERING and the New York Fire Department Library.



After: In service as Engine Co. 19, it was later converted by American-LaFrance Fire Engine Co.; the chemical hose was removed and tractor added. Tower raised to 25 feet

THE APPAREL PROCLAIMS THE MAN

FIRE ENGINEERING survey discloses firemen's uniforms now generally stylized, although some volunteers still sport the gay and gaudy

HISTORY RECORDS that in the "brave days" of the volunteer fire departments the costumes of the members, like their engines, were gaudy in the extreme. Obviously the raiment was designed for the panoply of parades and show rather than for fire fighting. In sartorial embellishment, the volunteers are said to have only followed the example set by their elected and appointed superiors who were arrayed like the "lilies of the field."

Nevertheless, we are told that the fireman was not deterred from wearing his "gorgeous garments" despite the fact that he regularly returned from a "conflagration" in a "sadly grimy and bedraggled condition." Despite the practical certainty that his raiment would be dirtied, the fire laddie of the 1820's was devotedly attached to a uniform consisting of a white duck shirt and a black leather belt.

About 1830, some companies in the City of New York adopted coats of heavy drab kersey cloth with large side pockets and enormous white bone buttons. Trousers were of the same material, with

FIFTY YEARS OF FIREMEN'S DRESS UNIFORMS

Above: Summer dress—circa 1905. The members of Ladder 71, New York Fire Department, wore straw hats "with the wearer's number on a patent leather background" as the regulation uniform headgear
—Photo courtesy New York Fire College Library

Left to Right: Until 1926, the New York Fire Department wore the blue flannel coat as regulation which was emulated by many departments throughout the country

The roll collar flannel coat was adopted in 1926 and is still the basic style of the modern uniform. The flannel cloth was replaced by serge about 1939

Colorful Civil War cavalry officer's coat was the pattern for the original fireman's winter overcoat, which was retained by many departments until World War II

The present-day overcoat for the most part no longer retains the colorful flannel lining of many years ago, but it combines comfort with good lines

Many of today's departments prefer the reefer-style coat for winter wear. It is especially popular with inspecting officers and drivers
—Photos courtesy Russell Uniform Co.

waistbands "made to button quick." Also, as an additional touch, the fireman wore a russet or black harness leather belt. A red woolen cap was carried in his pocket and he wore this instead of his regular hat when working at the brakes of his engine. Members of Excelsior Engine No. 2 featured fantastic big buttons and side pockets and they also carried canes when responding to an alarm.

The sobriquet of "red shirt"

The red flannel or wool shirt was destined to become the distinguishing mark of the New York fireman and to stay so until supplanted by the blue garment after the Civil War. Protection Engine No. 5 was slated to be the first company to wear the flaming red shirts to a fire back in 1840. Other companies soon followed suit and within ten years the common costume of a firemen was a red shirt, a pair of blue-black trousers, a patent-leather belt and a blue pilot-cloth coat.

In the early days, the volunteers resisted every attempt to regulate or standardize their official clothing but they were willing to wear any sort of hat or cap suggested by the city authorities. This feeling was carried right down to the year 1865 when the paid department was established in the City of New York.

When the wearing of uniform clothing was discussed by the city's first fire commissioners, many of the members threatened to resign before they would wear "livery." As an example to the fire force, all of the commissioners appeared in uniform and the incipient revolt died out.

First uniform regulations

The first rules and regulations, issued in 1865, described the uniforms to be worn. For the commissioners was prescribed a blue cloth cap, Navy style; frock coat, double-breasted with seven bronze buttons on each breast, three on each skirt and four on each sleeve. Pantaloons were to be made of the same material as the coat. Overcoats of navy blue pilot cloth cut to button close to the neck, with seven regulation buttons on each breast, three on each skirt and four on each sleeve cuff.

The chief engineer of the first department wore a similar uniform except that a red flannel shirt and a white fire hat were specified. Buttons for all chief officers were white metal with the letters "M. F. D." (Metropolitan Fire Department) inside a wreath design. The cap insignia was embroidered in gold with the word "Chief," "Assistant" or "Engineer" and the letters "M. F. D." underneath.

Officers and members of the companies wore a double-breasted blue flannel shirt, knee-length coat, pants and cap and the cap device was described as a white maltese cross with the emblem of the department in the center and the letters "M. F. D." and the number of the wearer on the points.

In 1866, the rules were amended to include a medium length summer coat made of dark blue flannel with a rolling collar. In 1868, white shirts were substituted for the red ones worn by chief officers and the red shirts became part of the company officers' uniforms while the men continued to wear the blue shirt.

That year will go down in history as the date when the trumpet was adopted as the fire department's insignia of rank, "to be embroidered in gold on the cap and coat lapels with the background color of the design to indicate the branch of service . . . blue for engineer officers, red for ladder company officers, green for chemical company officers and black for engine company officers."

The red shirt disappeared from the Metropolitan Department in 1869, when orders were issued prescribing white shirts for company officers after January 1870. Nevertheless it is still the parade costume of countless volunteer fire companies. In 1890, the metal insignia device was substituted for the embroidered design and the axe was adopted as the distinctive emblem for the ladder company officers.

The straight visor cap was replaced by the drop visor style in 1903 and white caps for summer wear by officers were introduced in 1907. Previous to that time, officers had worn a panama hat in the summer time and company members wore a brown straw hat with the wearer's number on a patent leather background sewn to the front of the hat.

There were no drastic changes in the design of coats and overcoats in the New York fire forces until 1926 when the roll-collar style of coat was adopted and the Civil War cavalry-style overcoat was replaced by the modern overcoat. The cloth was specified as wool flannel, and serge did not make its appearance in the New York City department until about 1939.

So much for historic progress in fire-

Continued on page 1005

Fire hose failure can spell all the difference between a fire that "gets away" and one easily extinguished. Here a fire fighter has found a break too big for his hose jacket. Modern fire hose withstands higher pressures, gives longer service than antecedents

Fire Hose Takes On New Stature and Stamina

The Fire Service reports on its hose preference, procedures and policies in this timely, comprehensive survey by FIRE ENGINEERING

ACCORDING TO THE NATIONAL BOARD of Fire Underwriters, "hose is now considered about the most essential equipment of a fire department. Except for the very small fire, its use is universal."*

Admitting this premise, it is nevertheless surprising to observe how little fundamental knowledge of fire hose, its manufacture, maintenance, application, and limitations, is possessed by the average fire fighter. Perhaps this may be taken as a testimonial to the quality of the hose manufactured over the years because the fire fighter is so seldom reminded of its limitations by reason of bursts in fire fighting.

This year, in reviewing the forward progress made by the fire service, the editors were reminded that developments have been occurring in the field of fire hose no less than in other branches of the fire service.

In fact, some authorities go so far as to claim that the progress in the past half-dozen years has been greater than that of any other period in the past three centuries. To evaluate that progress the editors have turned to over 1800 representative fire departments in cities, towns and villages in every state in the country, as well as to hose and fabric manufacturers.

* Special Interest Bulletin 62, August 15, 1938.

Brief historical high points

Histories of the fire service tell us the first fire hose was introduced in Amsterdam, Holland in 1672, six years after the London holocaust of 1666. This hose was of sewn leather and not withstanding numerous drawbacks, it served to relay water from one hand-operated pump to another. This type of leather hose was used in American colonial time until 1800.

In the early 19th century, copper rivets replaced hand stitching in leather hose, and this construction became the standard until rubber-lined fabric fire hose was introduced about 1859 in Manchester, N. H.

We are told that this hose was made of flat belting which was coated with rubber on one side. The material was then rolled to make a tube, with the rubber on the inside, and the seam riveted. This hose had its advantages over the previous bulky leather hose, but it went out of circulation in the early 1900's when it became possible to combine rubber tubing and circular woven fabric jackets to form the type of hose that was to serve for the next fifty years—and more, with but few important construction changes.

Enter—synthetics

World War II put the nation into the synthetic rubber business, and this had its effects on different kinds of hose. Writing in 1946 on the postwar hose products one authority said: "There are a number of changes in prospect in hose manufacture, but these will not affect the average user of hose. . . . Synthetic rubber tubes giving better service life than natural rubber tubes undoubtedly will remain in all postwar hose. Processing and manufacturing techniques conceivably might be improved so that machine-molded synthetic rubber tubes will equal the quality of handmade calendered sheet tubes. . . . Hose jackets undoubtedly will be improved for special services. Nylon as presently made, is not a good material for hose cord. There is entirely too much stretch to be acceptable. That characteristic of nylon which makes it an excellent material for ladies stockings because it is elastic, bars it for hose use. . . . Rayon has possibilities and there seems to be little question that it will be used in hose jackets where high tensile strength is required. Use of rayon will materially reduce weight of hose while increasing burst limits. . . . Acetylated cotton, if found to be mildew proof . . . undoubtedly will find a place in hose jackets. . . . The plastic elastomers also might find a place in hose jacket manufacture. The possibilities seem to be unlimited. During the war, plastic materials provided the answer to many problems, but very little is known at present about the service life of such products and manufacturers are unwilling to commit themselves on any service condition which includes a life or age requirement."

This prophet was not far wrong. In 1951, the Dupont Company, working with fire hose manufacturers, developed a new material—a polyester fibre called "Dacron," for fire hose. The company explored its possible application to fire hose just as it had its use in garments and a host of other products that could use synthetic fibres.

This fibre is produced from a chemical compound, a polyester made from ethylene glycol and terephthalic acid. In the manufacturing process, the polyester is melted, extruded through a spinneret to form a continuous filament yarn, and then packaged for shipment to hose makers.

But synthetic hose fibers were not limited to Dupont's Dacron, which within a span of a few years has been adopted in varying degrees by nearly all leading hose manufacturers. At least one old-time hose company uses a nylon fibre and one other well-known concern features glass fibre—perhaps the latest of the synthetics to enter the field.

These are the important progressive developments in this vital facility of the fire service. At the same time a concomitant of this progress has been a cloud of claims, counterclaims, and misunderstandings about these innovations; and it was to clear the confused air that the editors instituted the survey from which the following information has been assembled.

Cotton challenged

It is evident that the polyester fibre presents the first serious challenge to the natural material cotton, which has for so long been king of the hose jacket materials. Of course, claimants to any title must first prove their supremacy and in the important field of fire hose the judges and jury are men not easily swayed by words. Only proven performance will convince a service that demands and expects the finest.

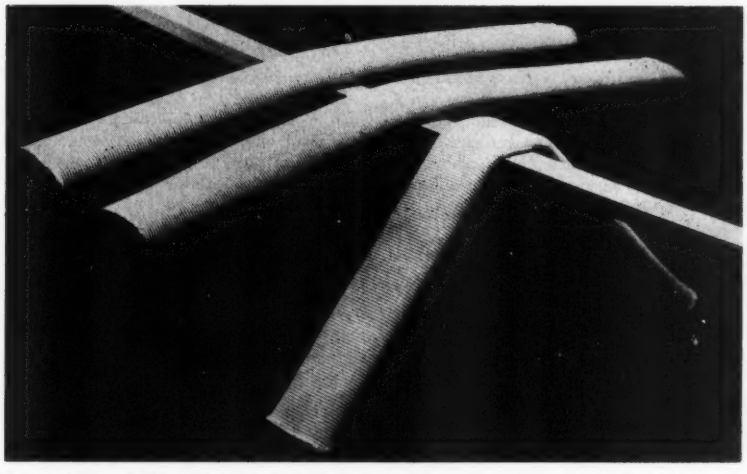
That the test is being undertaken is evidenced by the fact that 65 per cent of the reporting departments are using the polyester jacket hose. (The jacket referred to is actually a combination of the synthetic fibre and cotton; cotton, it should be said, has not disappeared from the scene by any means).

The amount of the new hose now in service varies widely according to the hose replacement program of the individual departments, but all the popular diameters are being tried under the varying service conditions which face the fire forces of this country. The possibilities of a fair test for hose similar to any new product being introduced to the fire service, are excellent. There are over 20,000 fire departments in this country and their conditions of operations vary from semi-tropical to extremely cold weather; from mountains and plains to seashore; from urban, suburban and rural, to the widely divergent industrial and forestry applications.

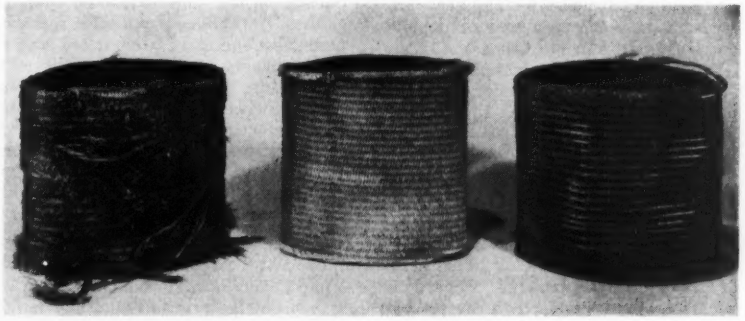
Current hose customs

Before presenting the opinions of representative users of the latest type hose,

Showing how polyester fibre cords are used in the "filler" of synthetic hose while cotton cords (which run the long way) make up the "warp"—*Photo courtesy B. F. Goodrich Co.*



Comparison of the polyester-fibre hose with the conventional all-cotton illustrates its greater flexibility. Firemen report "ease of handling" to be a leading advantage
—*Photo courtesy B. F. Goodrich Co.*



What happens to three types of fire hose after exposure to 17 per cent sulfuric acid at 75 degrees for a 24-hour period. All-cotton hose (left) had appreciable strength loss and severe damage. Single-jacketed hose of 100 per cent polyester fiber (center) was relatively unaffected, while the double-jacketed hose of both polyester fibre and cotton showed no damage to the filler—*Photo courtesy E. I. DuPont de Nemours Co.*

Comparison of the synthetic fibre hose with conventional cotton-type shows the compactness of the former. The roll on the right is nine pounds lighter than the all-cotton standard hose
—Photo courtesy B. F. Goodrich Co.

some comparative figures should be studied to indicate certain fundamental hose habits of the fire service.

The first general conclusions to be reached, based upon the returns of the questionnaire sent fire chiefs, show the relative use of hose according to different diameters, as follows: 90 per cent of the fire departments use 1½-inch hose (some few to the exclusion of any other sizes); 92 per cent of the fire departments use 2½-inch hose (use of 2-, 2¾-inch is mentioned); 2 per cent of the fire departments use 3-inch hose, or larger, in addition to the two standard smaller sizes.

Couplings

An interesting light is furnished by the reports on hose couplings in service, and preferred.

The rocker-type lug* apparently is now standard in 90 per cent of all fire departments. Pin lug couplings, according to the survey, are used alone by 7½ per cent. The remaining 2½ per cent of departments use non-standard types.

Many departments reported that pin lug couplings are still in service, although the type is no longer being specified on purchase orders.

Variations from standard practice

One of the questions asked of the departments was intended to sound out chiefs on the possible use of 2-inch hose. A majority of respondents believed it would be less desirable than the present 2½-inch standard, although a few were of the opinion it might have possibilities as a replacement for the present 1½-inch. For the most part these comments came from heads of departments in medium to large cities. One chief commented that with the present light weight of the new 2½-inch hose there was no reason for 2-inch. Another chief offered this comment, "Why 2-inch? The present 1½-inch and 2½-inch fill the bill. If you want to save all possible pressure for your nozzles, use light-weight 3-inch line for supply, as backup lines and for deluge guns, turrets, etc. Few realize it's merits."

Another question concerned the possible advantages of 100-foot lengths in place of the standard 50-foot length. Several chiefs reported that they would like to try some such hose as an additional means of reducing hose weight by eliminating one set of couplings. The majority of those reporting however, could see no advantage to the substitution.

Possibly the question of weight reduction on the larger size hose could be explored in another field. This was suggested by one chief, who stated that he would like to see 75-foot lengths of 3-inch ladder hose for use in supplying nozzles, when an aerial ladder is used as a water tower. He believed that the saving of weight would be advantageous.

Experience with new synthetics

Earlier we commented that the synthetic fibres posed the first serious challenge to cotton in fire hose. Although the survey did not bring to light any radical information concerning other synthetic fibres, it did provide considerable factual data on polyester fibres and their combination with cotton, now featured in the products of many hose manufacturers.

Asked point blank if the combination of polyester fibre and cotton was better than the straight cotton jacket, 48 per cent of the chiefs queried answered in the affirmative. Only 5 per cent stated they could find no advantages that would influence their changing from their present all-cotton jacket. The remaining 47 per cent reserved comment, primarily because of lack of experience with the newer product due to the short period their hose incorporating the man-made fibre had been in service.

What appeals most in new synthetic hose?

The factor that most appealed to the departments favoring the new hose was its light weight. More than one-half of those who advocated the new hose placed this feature first on their list of attributes. Second in favor was compactness, although the factor of flexibility ran a barely discernible third. Following the above leaders came strength, resistance to mildew and durability in that order.

Some qualifications registered

Efforts were made by the survey to disclose any disadvantages in the synthetic fibre hose and on this score a few respondents offered some qualifications.

Not a single voice was raised against the claimed advantage of light weight and compactness, but some questions were raised about flexibility. Several departments reported kinking as a bad feature. One maintained experience showed that when the hose was stretched and charged, the pressure failed to straighten out any slight kinks, as would be expected with all-cotton hose. This chief did not relate the kinks of which he complained to hose pressures or vice-versa.

On this subject another chief stated, "We found it too flexible, it kinked under pressure." Another said, "Pressure seems to twist or turn hose and either tighten or loosen the couplings." A few chiefs reported they had experienced difficulty in packing the newer hose on the apparatus.

It was also mentioned that the hose tended to lay over on its side if it was "edge-loaded," requiring very tight packing to maintain an even-layered load, yet the fact that the new hose permitted tighter packing and therefore larger storage was viewed as an asset by many respondents, in line with this thought. One chief commented: "The flexibility of this hose does not tend to support the layers above it as well as the all-cotton." Among the other minor observations offered, a few chiefs considered the new hose more difficult to roll up and keep in a roll. An unusual comment on hose loading concerned air. One department mentioned that air was trapped in the hose while loading on the apparatus, making it necessary to bleed the air to get a compact load.

Several departments reported varying difficulties in recoupling their hose. One stated that it was hard to secure the hose

Continued on page 986

* The term "Rockerlug" is the trade mark of the Akron Brass Mfg. Co. which introduced it, but today it has become a generic term, used by the fire service generally to describe all lugs having no pointed or sharp projections.

Belt assemblies holding battery and other gear used by Boston fire fighters are shown in this picture of crews being forced to backtrack from flame flareup during recent 4-alarm apartment house blaze

A FIRE ENGINEERING Survey
Discloses "Vital Statistics" about

Fire Fighter Personnel Protection

Revolutionary changes are taking place to make fire fighting safer as well as more efficient

AT BEST, FIRE FIGHTING is a dangerous job. Fire, and its components of smoke and toxic gases, is a treacherous foe of the fireman. So, too, are infection from cuts, overexertion and a dozen other hazards that dog the smokeater from the time an alarm sounds, until he has returned to his quarters.

In olden days the height of protection for the fire fighter was a leather or metal hat, and rubber coat and boots. Their use at fires was not always "regulation," and even where it was, part or all of the coverings came off at times, such as when practicing overhauling and mopping up. Those were the times of the strong lungs and weak mind. And they buried a lot of firemen in those days, whose boast was "they could take it." Masks were for the other fellow—the sissies. Even gloves were "fielder's choice" (did you ever inspect the backs of the hands of some of those veteran laddermen to see the scars left by broken glass sliding down the ladder rails?) As for goggles, asbestos suits (they had them in those days) and numerous of our "required" safety devices of today they had no place in firemanship.

It is a sign of the progressive times that FIRE ENGINEERING can report things are different today.

Safety in the fire service is a "must" in most municipal fire departments, at least insofar as personnel protection is concerned. And with the help of state, county and local fire schools and colleges, volunteers are becoming cognizant of it, too.

In many places this transition has come about *in spite of conditions*, rather than *because* of them, circumstances arising from the fact that fire fighters of today

face dangerous hazards never dreamed of by their progenitors.

"We live in a generation which has seen the greatest industrial expansion in history. We are currently in the midst of scientific and technical changes that are growing at an increasing rate of speed. The degree of accelerated progress becomes more apparent when it is observed that while it took the steam engine 100 years, the electric motor 50 years, and the internal combustion engine, the vacuum tube and radio 25 years to become standard parts of our industrial and economic makeup, it has taken television, synthetic rubber, plastics, miracle drugs, jet propulsion, not to pass up atomic energy, less than 10 years to become something more than promising realities." So wrote Dr. Mathew M. Braidech, Director of Research of the National Board of Fire Underwriters.

All this acceleration in living and working is producing fire and explosion hazards that lay in wait for the fire fighter who is sometimes too engrossed in his work to think of protecting his person against them. If you question it, review the casualty records as published by this Journal.

Reviewing the forward progress being made in fire suppression, measured against increasing fire hazards which fire fighters must encounter at some time in their career, the question naturally arose: Is the fire service doing all that it should to improve safety in the fire protection forces?

The best way to find out was to go direct to representative fire chiefs from coast to coast, and ask them. This, FIRE ENGINEERING did, in this instance with particular attention to protection of personnel. And here are the results of that survey:

Basic equipment—turnouts: The basic equipment (hat, boots and turnout) is regulation in 70 per cent of all departments queried. For the most part, these departments are full-paid and part-paid. Many volunteer organizations however, make the wearing of full basic equipment regulation, also.

In 65 per cent of these reporting departments, men are required by general orders to have the protective clothing on their persons when responding to an alarm.

The matter of purchase and issue of basic protective clothing varies widely. In many communities, the men purchase the necessary items as required, but over 50 per cent of the departments reporting issue helmets and turnout coats.

In 43 per cent of the departments it was stated that the so-called uniform allowance (discussed in detail in another survey) was intended to cover the cost of working equipment, in addition to the dress uniform.

Helmet types: As an indication of the penetration of plastics into the life of the fireman, it was disclosed that the most popular helmet style was the molded-plastic type. Nearly 73 per cent of respondents stated the synthetic material was "standard specification" although some reported that leather and metal styles still are in use but would be replaced eventually by the plastic type.

Metal helmets are standard in 14 per cent of the departments, and 13 per cent use the leather type. Incidentally, a number of large fire departments still adhere to light-weight metal head gear.

Canvas turnouts: There has been some discussion in firemanship circles over the relative popularity of canvas and rubber turnouts. According to replies to the survey, canvas turnouts, including coat and quick-hitch trousers, are popular in 62 per cent of departments while rubber is specified by 38 per cent.

In those departments supplying coats alone, rubber is more common, while reports indicate that among their personnel, there is preference for the canvas turnout pants. Breakdown by states of this question indicates that climate has a distinct bearing upon the styles of garments worn. The short canvas turnout coat, with duck or other canvas quick-hitch trousers, predominate in the warmer climates.

Although no chief commented upon it, personal interviews in different states among different volunteer departments suggest that one reason some volunteer companies like rubber coats is that they are more easily folded and make a better appearance when racked on apparatus.

Foot Protection: Puncture wounds rate high on the fire fighter casualty lists and it was interesting to determine just what men did about their footwear, particularly boots.

Only 5 per cent of reporting departments said boots were not used and of the great majority which used them, 45 per cent stated that metal or leather innersoles were standard protective devices for additional safety. The remainder reported that foot protection is optional with their personnel.

Hand Protection: An interesting detail of the study had to do with hand protection—gloves. This item is issued as standard equipment by many departments, in which cases the type and kind is determined by the department. Where gloves are not supplied as issue equipment, the men apparently prefer some definite style. The survey developed the styles preferred, as shown by the following table:

Rubber or plastic coated	30%
Canvas (many with leather palms)	17%
Wool	9%
Leather	8%
Unspecified	36%

In the case of gloves, as with turnout coats, the climate may have a bearing upon type and kinds of gloves worn. It was not determined to what extent department regulations make mandatory

Masks are considered "musts" in progressive departments today. Here Boston fire fighters take a breather during operations at hot, smoky American Legion Hall fire. Canister masks are augmented where necessary by demand breathing equipment

Type of goggles being tested by the New York Fire Department to reduce eye injuries such as are incurred in pulling ceilings. Note new helmet being used by "probies" of training school—*Hellriegel-Heffernan photo*

the wearing of gloves, but a number of municipal departments do so.

Equipment belts: There is some latitude exhibited by various departments in the case of equipment belts. They are regulation in 20 per cent of the departments reporting, and where not required, are sometimes carried as optional equipment by men who desire them.

Several respondents said that only ladder truck personnel were required to carry equipment belts. A number of reports listed the use of rope hose tools as belts. In addition to other items desired, they are always available to the men whenever needed for their original purpose.

Items most frequently carried by personnel equipped with the belts were reported as follows:

Spanners	64%
Hose straps	18%
Axes (including pompier hatchets)	14%
Rope	3%
Hydrant wrenches	2%
Flashlights	1%
Other	1%

Additional protective equipment

As additional protection for personnel engaged in certain operations it is common practice for most fire departments to carry special safety equipment on the apparatus, rather than to distribute it to all firemen. When such special material is needed men detailed to the tasks requiring its use, obtain the equipment before going into action. Inventory of most rescue units, also, will indicate the extent to which these special items are carried.

In an effort to gain a clear picture of the general use of the more important special protective items, fire chiefs were asked to report on six items carried by the department. This they did as follows:

Face shields	7%
Goggles	24%
Rubber safety gloves	74%
Asbestos safety gloves	46%
Asbestos sheets	14%
Flame-resistant rescue suits	18%

One department reported that face shields are standard equipment for all ladder trucks. A detail worthy of special mention is the decision to equip all men of the New York Fire Department with safety goggles. Eye injuries, many of them due to plaster and other dust, have a high incident in most municipal fire department accident records. It is believed that New York is the first large fire department to plan to equip all individual fire fighters with such devices.

Other equipment details which are taking hold widely are asbestos sheets and gloves, and the new insulated, aluminized safety suits. Where before, departments so equipped carried only limited numbers on rescue or other special units, now serious consideration is being given to providing such safety features for all apparatus.

Breathing equipment nearly universal: An encouraging note sounded by the survey concerns respiratory equipment. The use of respiratory protective breathing equipment is practically universal, a marked contrast to conditions of not so many years ago.

Only two paid departments and four volunteer out of the several hundred respondents, reported that masks were not supplied. While many reported the use of the filter-type mask alone, the great majority use demand-type or self-generating masks in addition. It was also surprising to note that many chiefs reported the use of self-contained breathing equipment to the exclusion of the filter mask. It was noted, also, that a number of departments have hose masks in service.

The following table indicates the percentages of mask equipment in service:

Filter masks	70%
Demand air masks	67%
Oxygen (demand or self-generating)	50%
Hose masks	2%

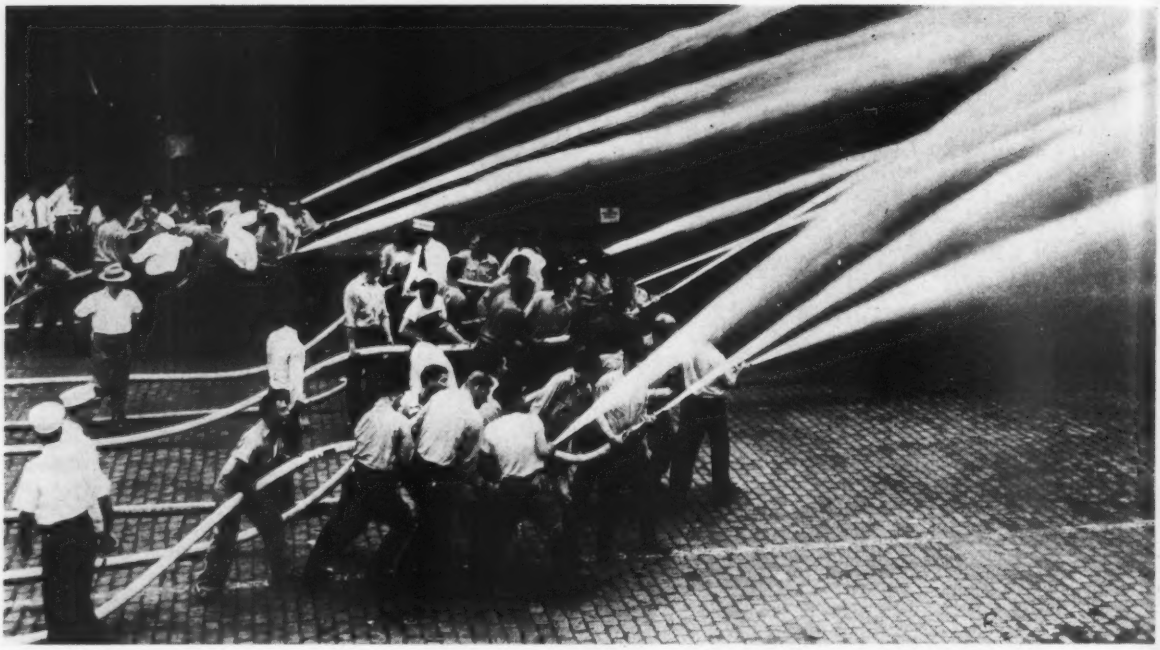
Reviving Apparatus: Another encouraging detail of the study concerns equipment for emergencies involving victims of smoke, gas or drowning, possessed by fire departments.

The popular resuscitator is in use in 88 per cent of the fire departments reporting, and inhalators were mentioned by 57 per cent of respondents. A great number stated that both items of equipment are in service.

Another modern protective device which is coming into broader application is the explosive gas detector, or explosivemeter. Twenty-four per cent of the departments reporting have purchased these devices.

No accurate figures were received on the adoption of Geiger and other counters for detecting radioactive materials, but such safety equipment is being considered by many departments, particularly those in industrial "target area" cities. □□

This type of modern insulated heat-resistant suit enables wearer to comfortably withstand temperatures of over 1500 degrees F.
—*Photo courtesy Minnesota Mining and Manufacturing Co.*



New York Fire Department auxiliaries directed by "regulars" operate hand lines during Manhattan exercises to try out Civil Defense water pipe system, held prior to tests to determine capabilities of high pressure distribution system. Streams were from pumpers supplied by fireboat —*Photo courtesy "WNYF"*

New York Closes High Pressure Stations in Favor of Modern Fire Department Pumpers

Tests develop theory that powerful mobile pumping engines will provide large volume defense at greater economy and efficiency

THE FIRST HIGH PRESSURE fire system of any magnitude in this country, that in Manhattan and downtown Brooklyn, N. Y., officially passed into history on June 29, 1953. Nevertheless, it has not entirely gone into oblivion; certain of its functions continue to serve and doubtless will do so for many years to come.

The system dates back to 1903 when plans for it were made following several large fires which occurred in New York and other cities. Plans reached fruition, and the system went into commission on July 6, 1908, not without some misgivings on the part of skeptics who feared trouble that might eventuate because of the high pressures it might be called upon to withstand.

The original system in Manhattan protected some 2,600 acres and comprised 94 miles of mains 12 to 24 inches in diameter, with 2,065 hydrants. Two pumping stations, one on the North and one on the East River, supplied the water.

The Manhattan system was originally bounded by 23rd Street, Madison Avenue, 24th Street, Lexington Avenue, 14th Street, Third Avenue, The Bowery, East River, Maiden Lane, Nassau Street, Chambers Street and North River. Extensions installed in 1913 and 1914 extended the system to 34th Street in high value areas.

The Brooklyn System covered 2,500 acres, had two pumping stations and 1,230 hydrants. It was originally bounded by the East River, U. S. Navy Yard, Fort Greene Park, Fourth and Fifth Avenues, 39th Street, Gowanus Bay and Erie Basin. The Red Hook and Gawanus extensions were placed in service October 30, 1913.

The initial contract for all the Manhattan installation (with which this report is most concerned) called for delivery of 3,000 gpm by each pump in each pumping station, at a discharge pressure of 300 psi. At their acceptance tests the fire pumps in each station totalled a delivery of about 18,000 gpm. Fresh water for each station was supplied through two 24-inch mains connected with a third of 36 inches. Salt water could be supplied, if need be, from the North and East Rivers, through two 30-inch pipes. The pumps were all of 5-stage centrifugal, electrically operated; each stage designed to give a pressure of 60 psi to a combined pressure of 300 psi with five stages.

The average pressure required for fire duty was 125 to 200 psi at the hydrant and each station working under those conditions could deliver better than 30,000 gpm. It was confidently believed, and never proved otherwise, that with this volume of water concentrated within a radius of 500 feet, no imaginative conflagration could survive its attack.

Two 24-inch mains led out of each high pressure station, intersected at frequent intervals by lateral branch pipes of 12-and-16-inch in turn cross-connected by 20-inch mains. The hydrants are connected to the mains by 8-inch branch pipes, gates being provided at intervals of about 250 feet. The system was so planned that without excessive drop in pressure due to friction loss in mains, it

was possible to concentrate 20,000 gallons of water a minute upon the average block of buildings, or the full capacity of both stations upon an area of approximately one-quarter of a square mile.

The hydrants selected were furnished with four 3-inch outlets, providing a capacity of four 2-inch streams with 75 psi pressure, and roughly 4,000 gpm.

In order to be certain that valves could be opened against the heavy pressure liable to be met in the system before it was formally handed over, extensive tests were made. The first of the two most noteworthy trials occurred along the North River. There, twenty-one 3-inch hose lines were stretched from seven hydrants, and twelve 5-inch and nine 1½-inch nozzles were used. Within two minutes after the order to start water was given, a nozzle pressure of 80 psi was registered, and so great was the volume of water delivered that "the streets speedily became a lake and overflowed towards the docks," as Chief Edward Croker's report described it.

The second test was even more exhaustive. Twelve 3-inch lines with 1½-inch nozzles; six siamese lines with 2-inch nozzles; a water tower with a 2-inch nozzle, and a deck pipe with a 1¼-inch nozzle, were all brought simultaneously into action. One minute after giving the order to start, a nozzle pressure of 150 psi was obtained, and in two minutes, 195 psi was registered on the 1½-inch nozzles and 170 psi on the 2-inch. With nozzles elevated to an arc of 80 degrees, this pressure carried a solid stream of water 100 feet above the roof of a 14-story building.

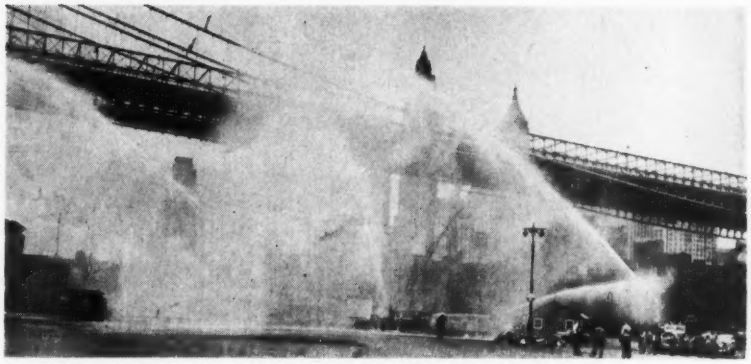
In December, 1908, the New York Fire Insurance Exchange made a general reduction of rates throughout the high pressure zone in Manhattan.

System met severe test

On January 7, 1909 the system had its first real test. On that day, with streets almost impassable with snow, the temperature just above zero, and winds at 50 mph, at 7:24 p.m. the department was called to a fire in a 7-story building at Hudson and Franklin Streets, occupied by a wholesale tea company. With the building heavily involved, and severe exposure hazards, Fire Chief Croker called for a fourth-alarm assignment. While most of this force was still operating on the warehouse fire, a third-alarm fire occurred on the Bowery, and a fifth-alarm blaze on Broadway, all within a square mile area.

Each of these three fires would have been a fifth-alarm fire under the old order, but all were handled by the high pressure system without any difficulty. It is reported over 14,000,000 gallons of water were delivered from the pumping stations on these fires at a pressure of 225 psi at the hydrant. This was done with but seven of the ten pumping units in service, the other three being held in reserve. Chief Croker said that 100 steam engines would have been required to deliver the same amount of water and under the conditions, he doubted very much if it could have been done.

The cost of electric current used at these fires was $1,200.



Heavy turret streams on Manhattan's east side developed in one phase of tests in which 40 New York Fire Department Civil Defense pumpers delivered 30,000 gpm out of Manhattan high pressure system without utilizing high pressure pumping stations —*Photo courtesy "WNYF"*

So much for the historic background of the famous system. From 1908 until 1953 it operated satisfactorily. However, as the years passed, fears increased that the aging system might not be able to withstand the original maximum pressures of 300 psi notwithstanding the fact that it was never called upon to operate at this maximum.*

Some years ago, as a precautionary measure, orders were issued revising the maximum downward. Still later, this

Continued on page 991

* Section III, Special Order 105, June 26, 1953, stated, "The High Pressure Pumping Stations in Manhattan and downtown Brooklyn will be discontinued at 8 A.M. June 29, 1953. However, arrangements have been made with the Department of Water Supply, Gas and Electricity to maintain the present high pressure hydrants and mains, and in addition there will be available at least 30,000 gallons per minute at a residual pressure of 100 pounds to 125 pounds on the system at all times.

Proposals for the maximum pressure on the system called for 400 psi "higher than any heretofore known pressures on fire mains" (*Fire & Water Engineering, Feb. 23, 1907*) In the original agreement, also, with the New York Edison Co. it was stated, "Failure of the NYE Co. to supply 400 psi within three minutes would result in a fine of $500 per minute." However the maximum limit ordered by the department was set at 300 psi.

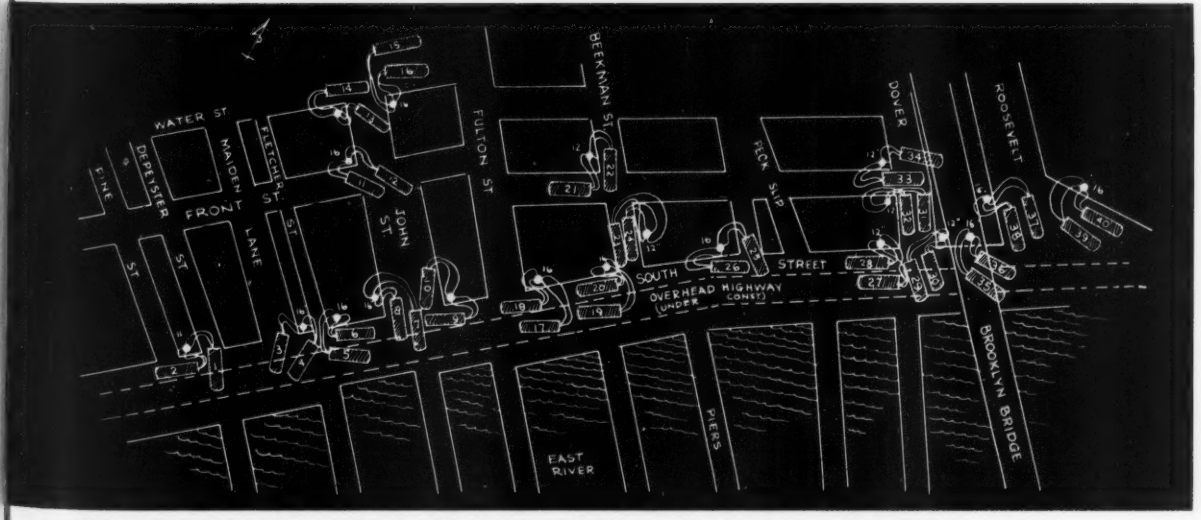


Diagram of 40-pumper layout for Manhattan high pressure tests conducted in a 12-block area along the East River. High pressure pumping stations were valved off and only high pressure hydrants used by pumpers for tests —*Diagram courtesy "WNYF"*

Three fireboats operate on windward front while fire spreads landward. One boat is shown attempting to save big gantry crane, while boat, far right, loses battle to prevent involvement of old ferryboat. Note old steamship being towed from dock and crowds lining bridge
—Oregonian photo

Simultaneous Multiple Alarm Fires Endanger Portland, Oregon, Areas

Mutual aid invoked when all available city forces are engaged; Fire fighters praised for controlling fires against odds

EVERY FIRE OFFICER dreads simultaneous fires, particularly those of multiple-alarm proportions. Nevertheless, every experienced fire fighter appreciates the possibility of such a coincidence occurring in his city.

Such a possibility became fact in Portland, Ore., on September 5 last, when three fires broke out within less than 30 minutes of each other, calling into action every available piece of fire apparatus including all the reserves, as well as heavy reinforcements from out of town.

Three other hazardous factors conspired to increase the serious threat to the city posed by these fires. These were low humidity; strong, gusty winds; and delay in notifying the fire department of the start of what turned out to be the worst of the blazes.

The action began with an alarm by telephone for a fire in the Monarch Shingle Mill, 841 N. Vancouver Avenue. At this time the humidity was 21 per cent, the wind east by northeast, gusty, at 25 miles per hour.

The box (35-47) assignment dispatched to this blaze consisted of Engines 29, 30, 14, 24; Ladders 7, 15; Battalion Chief 3. At 11:50 a.m. by Battalion Chief 3, a second alarm (Box 35-47) was sent in, bringing Engines 36, 8, 34, 13; Ladder 1. Battalion Chief 4; Squad Wagon 1 and Compressor 1.

The loss caused by this fire is given as $80,000. All the above units were operating at that location when the second blaze was reported. This also by telephone was clocked at 11:50 a.m. for a threatening fire in a large frame residence at 2117-2123 S. E. Hawthorne Boulevard.

Responding on the telephone alarm were Engine 9 and Ladder 6. A call for a full box assignment (Box 42-53) was received by radio from the scene at 11:59 a.m., which was answered by Engines 23, 22, 12; Ladder 4 and Battalion Chief 5.

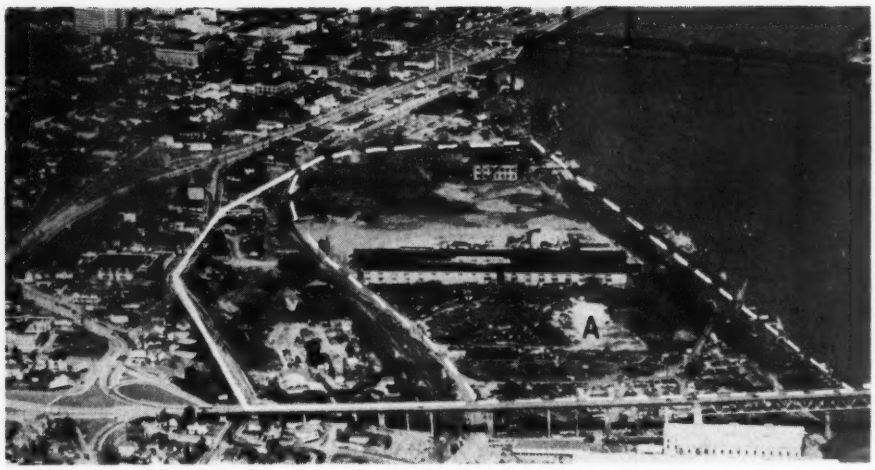
At 12:05 p.m., by Engine 9's radio, a second alarm (Box 42-53) brought Engines 24, 4, 1; Ladder 2, Battalion Chief 1 and Compressor 2 into action.

The extra calls for this fire were occasioned by the strong wind and dryness which threatened to spread the flames into other structures. The loss, however, was held to $9,000.

Three Strikes—and out of control

The alarm for the third and worst blaze in a dozen years, according to firemen, was received via telephone at 12:14 p.m., while all hands were still operating at the other two fires. This was phoned from the Zidell Machinery Company, 3121 S. W. Moody Avenue, a large dismantling firm.

According to Fire Chief Edward Grenfell, who commanded fire fighters during the hectic period, Fire Marshal Dale



Air view of Portland fire area before conflagration, looking north along the Willamette River. All buildings shown within Area A (dotted line) were destroyed and those within Area B (solid line) were damaged by the raging fire. Brands also set fires among houses four blocks inland
—Portland Fire Bureau photograph

Gilman who investigated the blaze, it was evident this fire was first fought by employes and that there was a delay of approximately 15 minutes in calling the fire department, following the discovery of the fire.

Awareness by first-arriving firemen of the threatening character of this blaze is evidenced by the fact that a third alarm was radioed at 12:16 p.m., only two minutes after the receipt of the first alarm.

These alarms brought into the major conflict 13 engine companies, two ladder companies, three fireboats, one squad, two turrets, one compressor company and four chief officers, all the available forces the harrassed fire alarm bureau could dispatch. In the face of the growing emergency, Multnomah County mutual aid was invoked, bringing into the city seven pumper companies. At the same time all off-shift Portland firemen were called back to duty to man eight of the department's reserve pumpers and one spare ladder unit. Off-shift personnel not assigned to the reserves reported to the main fire.

The properties ultimately involved in the major conflagration included the following: Zidell Machinery Co., whose dockside property extended 3,234 feet south along the Willamette River and included two World War I shipbuilding plants used as shipwrecking establishments and storage of scrap steel, machinery and junk. The main storage shed in which was located the firm's office, a similar structure and two smaller buildings were of corrugated iron construction on wood framing. The docks were of wood, built on piling, and open. Several vessels in various stages of dismantling were moored at the docks.

The two main buildings measured 800 by 100 feet by about 60 feet in height. Located at the southern end of the docks was a huge $100,000 traveling gantry

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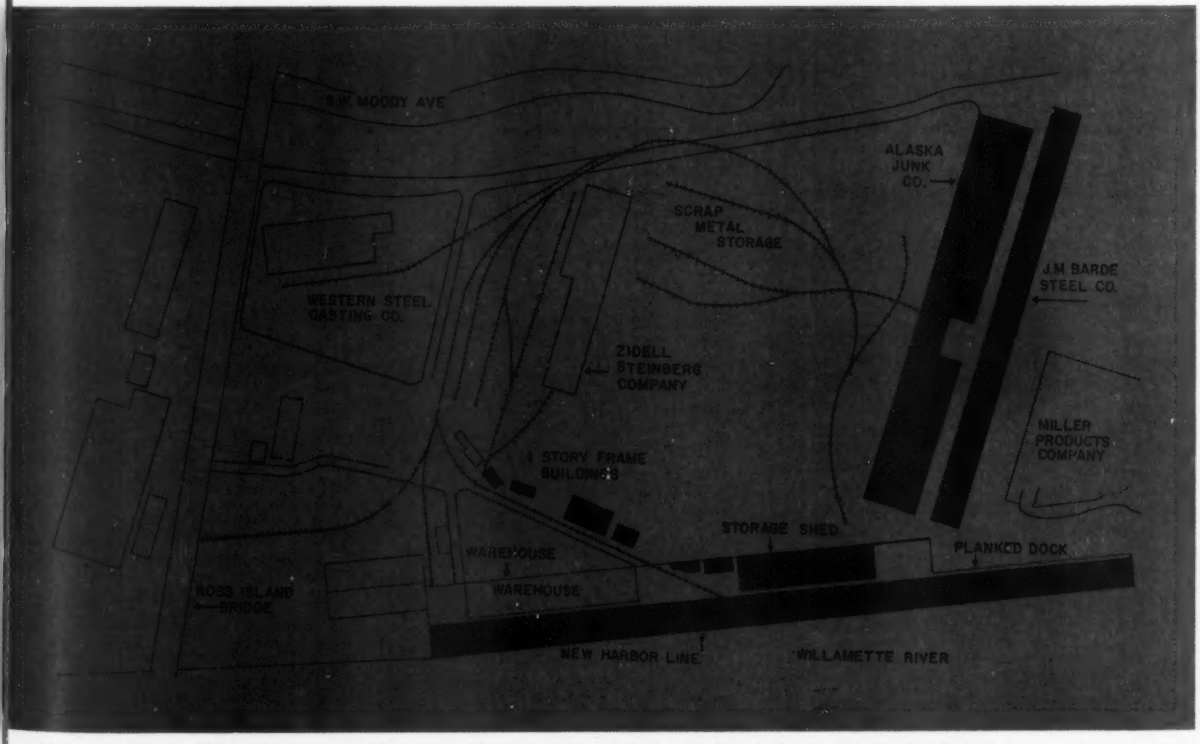

Diagram of major fire area shows Zidell Co. property extending north and south at dockside with J. M. Barde Steel and Alaska Junk Co. buildings at right angles. Fire wrecked structures shown in solid black—*Diagram courtesy Portland Fire Bureau*

Sedgwick County fire stations are fashioned for utility and picturesqueness

The Genesis of a County Fire Department

Still an infant in years as fire departments go, the Sedgwick County Fire Department has matured mightily in the last decade. This is the story of its conception and development

Raymond A. Davis has been chief of the department since its inception as a volunteer brigade of the County Engineering Department

THE HISTORY OF MOST FIRE DEPARTMENTS suggests they came into being following some serious fire which emphasized their vital need to the good people of the community or area which they eventually came to protect.

It is doubtful, however, if many had their origin because of burning bridges. Nevertheless, it was the destruction by fire of two county bridges that launched the Sedgwick County Fire Department, of Sedgwick County, Kansas.

The fires which sparked the chain of circumstances that wrought this development occurred back in 1948. The causes and the property losses have long since been forgotten, but the natives of the area still say that if they had had a fire engine when those fires struck they would never have lost the bridges.

Be that as it may, spurred by the bridge catastrophies, the County Engineering Department organized a fire brigade, and equipped it with a veteran Seagrave pumper, acquired from the Wichita, Kans., Fire Department. The brigade with Raymond A. Davis as chief, consisted mostly of engineering department personnel. The men were paid their regular hourly wage whenever they were called out for fire duty.

It was only a short time before this fire force was responding to calls from all over the county to combat fires of every description.

Expansion quickly followed

In 1949 the department answered over 100 alarms for all types of fires and the need for additional equipment became increasingly apparent. As an expediency, a seldom used core drilling truck was pressed into service to carry extra hose, and tanks were constructed which could be loaded on sand trucks when needed and used to back up the pumper with additional water.

Late in 1949, the Engineering Department purchased another pumper and in 1950, when alarms jumped to 450, a third pumper was added. This equipment was supplemented by a pick-up truck

equipped with a booster pump and tank for combating grass fires and wetting down at farm fires. To overcome the water problem the department also added a 1,700-gallon tanker which the members equipped with a 500 gpm front-mount pump.

As alarms increased to nearly 600 per year the good folk of the county began to depend more and more on the services of the fire brigade and questions were raised as to further improving its efficiency. Among the questions was that of more strategic locations for equipment throughout the county rather than locating the fire force at the county yards. The outcome was that petitions were placed before the county commissioners for this improved protection including the inauguration of a fully-paid department.

State Legislature assists

About this time a legal question arose concerning the operation of the brigade by the county. With the backing of the people, the County Commissioners requested assistance from the State Legislature and enabling laws were passed to permit the County to form a fire district. The act permitted the County to set up the district exclusive of cities; incorporated towns could join if they wished. With this authority the commissioners borrowed $300,000 to create a paid department and provided an initial budget of $180,000 for the year beginning January 1, 1955.

At 12:00 midnight on December 31, 1954, the 15-man volunteer department went out of existance and at 12:01 a.m., January 1, 1955 a 36-man fully-paid department began operations under Chief Davis who had been selected as the logical man to head the new organization.

Well equipped department

Today the roster includes 46 men arranged in two platoons with five men at each of four stations. Two "swing men" cover Kelly days and two extra men fill in for rotating vacations.

A fifth station is in the planning stage and a new pumper-tanker has been acquired for this location.

Chief Davis maintains his office at Station No. 1 where there is space for his car, two pumpers and a tanker. Assistant Chief Eugene Otti has an office in Station No. 2 where his station wagon is housed, along with three pumpers and a tanker. The rescue squad, two pumpers and a tanker are located at Station No. 3, while Station No. 4 houses two engines and a tanker. All engines have 600 gpm front-mount pumps and carry standard equipment. The tankers are of 1,700-gallon capacity and are fitted with 500 gpm front-mount pumps.

All apparatus is radio-equipped on the County Sheriff's frequency and extensive use is made of walkie-talkies. The specifications for the pumpers and tankers were drawn in cooperation with the Kansas Inspection Bureau in order that full insurance credit could be obtained through their assistance. As a result, the premium costs for fire insurance to residents of the county have been reduced and more important, the total amount of insurance allowable on farm buildings has been increased.

Intensive training program

According to Assistant Chief Otti, who is in charge of the training program, starting a department overnight poses many problems. Nevertheless it has its compensations, one of which is the dream of many chiefs: All tools on every piece of apparatus in the department are in identical locations. It is only necessary to teach a man the placement of equipment on one truck and he automatically knows the layout of all.

During the first month of operation all men returned on their off days for training in order to get into shape as soon as possible. Since then all training has been conducted at the stations. A unique drill tower previously mentioned is installed at each fire house where the men can train with ladders and advancing hose lines. Smoke rooms and fire doors are provided for actual fire fighting practice.

The department owns a sound projector and tape recorder and training films are used extensively to supplement actual practice. An office chart is maintained which graphically shows the progress of each man in the training schedule including such fundamentals as driver training, pump operating, chemistry of fire, building construction and inspection, map and building sketching, forcible entry, ladder operations, hose evolutions, first aid, knots, ventilation, salvage and all other standard fire service procedures. In addition to knowing the water supply locations and routes in the county, the men are required to make and correct the highway maps in order to maintain their knowledge of the territory. A bulletin board in each station carries notice of all road repairs and bridges which are out of service so that alternate routes may be studied and used.

Industry aids new department

When more specialized training is scheduled that exceeds the facilities of the department, the men are taken to the grounds of the Beech Aircraft Corp. where they can make extensive use of pits, tanks and aircraft for learning the fundamentals of spill fires and crash work. The cooperation of the corporation has been of great help to the new department in getting started.

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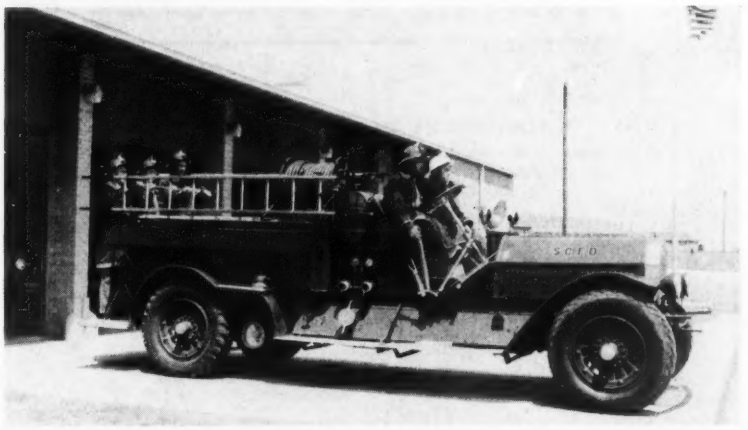
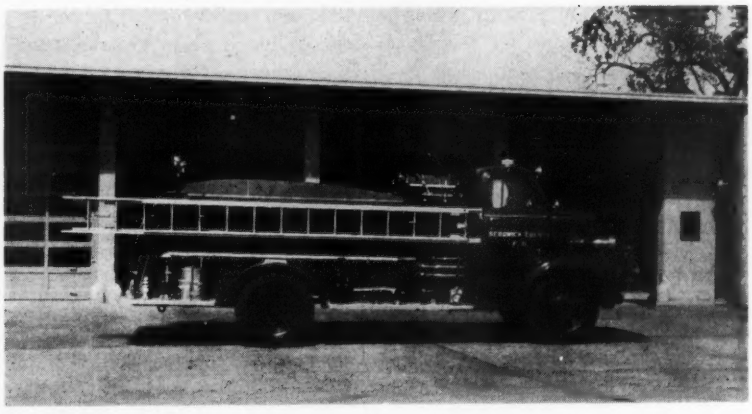




Top: The original 1917 model pumper purchased by the County Engineering Department launching its fire protection service, is still functioning, but is maintained for parades and exhibitions

Bottom: The latest engine acquired was placed in the newest station, No. 5. Designed in cooperation with the Kansas Inspection Bureau, it features a 600 gpm front mount pump and a 1,000-gallon tank

Thruway personnel receiving firemanship training with the new specially designed and built apparatus, one of 23 all-purpose rigs which will be used for fire and other emergencies along the 427-mile highway

Problems of Speedway Fire Protection

Experiences of the fabulous New York State Thruway may serve as guide in planning fire safety programs for the nation's multi-billion dollar highway project

A Special Fire Engineering Report

Prepared with the assistance of the New York State Thruway Authority, B. D. Tallamy, Chairman; Holden A. Evans Jr., General Manager; Warren M. Wells, Director, Department of Operations; and Arnold G. Fisch, Traffic & Safety Engineer.

SOME 20 YEARS AGO, the motoring public was satisfied to drive from community to community, not being too concerned with the total distance covered each day. Then as motoring grew and the need for more and better highways grew with it, far-seeing officials of New York State envisioned the day when one could motor all the way from New York City to Buffalo without halting for a single stop light.

After some planning, a road development program was initiated in the central part of the state where some 25 miles of dual-lane roadway was built. However, the cost of such a super-highway soon exhausted the capital fund budget of the State Highway Commission and it became necessary to consider other means of financing if a complete net of super-highways such as had been proposed, was to serve the public.

To meet this challenge, the New York State Thruway Authority was established and authorized to issue bonds, the obligations of which were to be met by the collection of highway tolls.

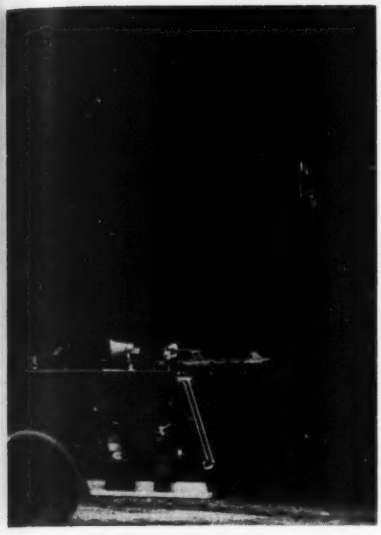
The Board was granted wide authority of operation. The responsibility for the creation and development of the superhighway was charged to three commissioners who were appointed by the Governor to serve terms of three, six and nine years. Power to do whatever was necessary to build and operate the road was granted by the legislative act creating the Authority.

The authority of the Thruway Board however, did not extend to other units of state government who were restricted in their power to enter into contracts. This was most noticeably true with fire districts which could not enter or consummate agreements at a fixed rate to extend fire protection to an area of the Thruway which was outside an established fire department, or which were within another fire department but could not be protected by that department because of its inability to enter upon the Thruway at the point of the incident (due to lack of access roads).

Statistics of the Thruway

Costing approximately $1 billion, the New York State Thruway is presently the longest continuous toll speedway in the nation. Total mileage is 562 of which 427 are for the New York to Buffalo section.

The four-lane concrete highway, with its stabilized shoulders to the right of



all lanes for emergency parking, bisects 19 counties and carries the traveler the entire distance without a traffic light. Curves and grades are light. There are bridges with ample clearance at 507 sites between New York and Buffalo.

An unusual feature is the 6-lane, 3-mile long Tappen Zee Bridge over the Hudson between Tarrytown and Nyack, which cost $60 million.

Thruway speed limits are 60 mph for passenger cars and 50 mph for trucks. Over 20,700 acres of land (an area larger than Manhattan) were acquired for the enterprise. A 20-mile belt along the Thruway route contains 80 per cent of the State's population, 15 per cent of the area in which are located 79 per cent of the state's motor vehicles, 83 per cent of its trucks, and all of its seven cities of 100,000 population or over.

There are 50 interchanges between New York and Buffalo with service areas (gasoline stations) and restaurants about every 25 to 30 miles apart. Some 15 section-maintenance buildings dot the route.

For the year 1955, the total trips on the Thruway were 14,287,393; the miles traveled by vehicles amounted to 918,501,982. Of these, 9,809,893 were by passenger and 1,285,850 commercial units. Total tolls for the year were $12,732,834.

The 1955 fatality rate on the Thruway, per 100 million miles, was 3.83. Of 1,643 accidents investigated that year 26 persons were killed in 24 accidents, and 581 injured. The number of emergency calls of all kinds, including fires, for the year was 46,309. Those involving wrecks totalled 342. There were 111 fires reported during 1955, the first full year of the Thruway operations.

Of these 111 fires investigated, 42 involved passenger cars, 58 trucks and two buses. There were 9 miscellaneous fires, including those involving buildings (see tabulation).

Fire protection

Fire protection on the Thruway is provided two ways: Immediate, or what might be termed "first-aid" protection is afforded by police, maintenance and other Thruway sources, equipped for the task. For such operations the Authority has equipped all of its patrol and many of its maintenance and other vehicles with two large 20-pound fire extinguishers and other fire equipment.

Professional fire protection (called for serious fires and/or accidents), is furnished by fire companies adjacent to Thruway interchanges under the state's county fire mutual aid plans.

In addition, to further strengthen fire protection, particularly in areas where municipal, public protection is not immediately available, 23 pieces of special fire fighting apparatus are being installed. One of these, together with a 1,000 gallon water tanker, constitutes the Tappen Zee Bridge fire protection.

Initial fire fighting is usually done by the Special Police Thruway Detail of the N. Y. State Division of Police, which patrols the route day and night. In 1955, this force numbered 130 men, operating some 138 radio patrol vehicles out of 25 police patrol posts.

Last year, these troopers traveled 5,559,095 miles, investigated 2,170 complaints and made 7,654 arrests. They investigated 1,653 accidents and 111 fires on the highway, many of which they extinguished. In others, they worked along-

INCIDENTS INVOLVING FIRE

July 4, 1954 to May 10, 1956

Total Incidents of All Kinds

1954 (6 months period)	38
1955 (12 months)	178
1956 (Through May 10)	87
Total incidents	303

Type of Incidents

Cars	88
Trucks (and truck tires)	104
Grass and brush	47
Buildings	4
Bus	4
Hay (Also involves vehicles)	3
Trailers	6
Miscellaneous	50
Total incidents	303

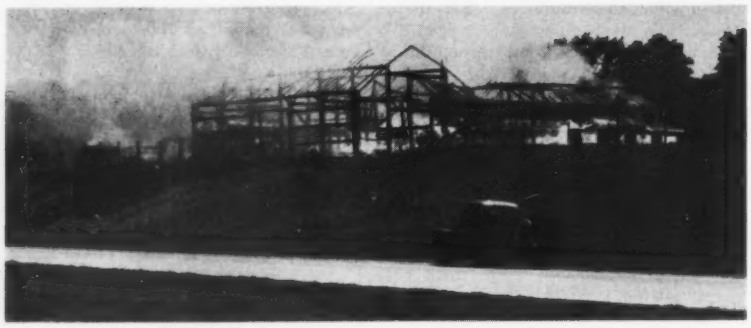
No. of times public fire departments called—71

No. of times public fire departments refused calls—3

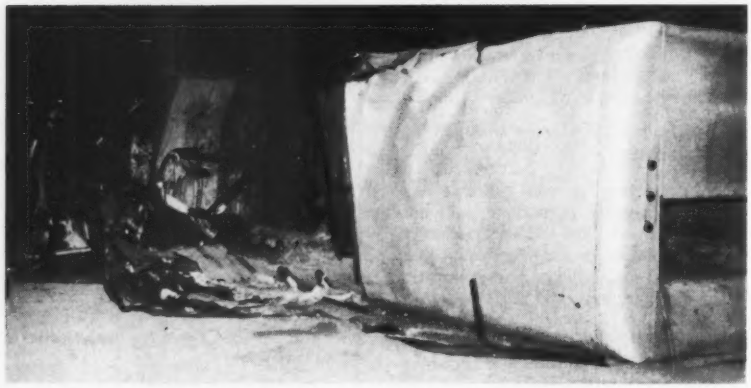
Balance of incidents involved fires that were extinguished by police and/or maintenance or other Thruway personnel, or by vehicle drivers or others.

Fires were the direct result of accidents in a number of cases, some resulting in the death of persons or animals. Twenty-five of the fires involved tractor-trailer trucks, some of which caused heavy property loss. A number of trucks involved in incidents were loaded with chemicals or other combustibles.

LEFT: Fultonville and Canajoharie, N. Y., Fire Departments operate on tractor-trailer fire caused by blowout on left rear tire which caught fire. Trailer and contents were a total loss. **Right:** A hot tire started this tractor-trailer fire. Note how fire communicated to interior. A good stop was made by Leeds and Cairo, N. Y., Fire Departments after truck driver was unable to control blaze with hand extinguisher



Fire consumes barn and adjacent storage buildings of farmhouse over 100 feet from shoulder of the Thruway. About 50 feet of right-of-way was burned off



Trailer-tractor with four horses left highway, hit bridge pier, overturned and took fire. Driver and one horse died of burns. Henrietta, N. Y., Fire Department extinguished fire

Jet aviation fuel makes hot fire on Thruway. Tractor-trailer load went off road, jackknifed after rolling over. Fire burned for approximately nine hours while two fire companies, without necessary foam, stood by to protect exposures

side municipal fire fighters, volunteer and paid.

The fire fighting and rescue equipment of these special police detail cars may be of interest. It includes the following: One-quart size vaporizing liquid extinguisher; one Karboloy extinguisher; one dry chemical extinguisher (20-pound); one pair asbestos gloves; one first aid kit; one crowbar; one disposable blanket; 100 feet of ½-inch rope; four 4-foot looped steel rods for roping off emergency areas; one axe; flashlight; one 100-foot steel tape measure.

Each vehicle operated by a commissioned or non-commissioned officer also carries an asbestos blanket. The asbestos blanket and gloves were added in 1955 and are reported highly useful. Non-commissioned personnel also carry press-type cameras and photographic equipment, for photographing accidents and fires.

Communications facilities

Rapid, accurate communications are vital in fire and accident control along such a vast enterprise as the Thruway. A special communications system was designed and installed by the New York Telephone Co. It provides instantaneous communications 24 hours a day between police, administration, maintenance emergency and toll-operated cars, and Thruway headquarters. It involves the use of radio telephone, telephone and teletype.

There are 48 base radio stations in the radio communications system which operates 475 mobile radio units. Five of the Thruway headquarters have teletype machines. Communication center is located in Elsmere, N. Y., where the entire radio system is monitored 24 hours a day. Here, large magnetic maps are used to spot weather conditions, accidents, fires and other vital information.

The radio traffic is handled by radio divisions, three of which are in continuous individual service at all times. All radio transmission is automatically recorded on magnetic tape recorders.

While the present Thruway communications system is highly efficient, plans for further improvement are under consideration. These include the use of closed circuit television; limited coverage radio broadcasting; radar-controlled speed signs for traffic control. The installation of automatic signaling devices is also being investigated. These devices would enable a patron with a disabled vehicle (whether from fire or other emergency) to transmit coded signals to the nearest State Police or Thruway vehicle.

Ambulance service

At the present time 45 ambulance services are providing protection along the super-highway. These are all private or municipal services, not a part of the Thruway Authority. They operate by agreement, and are individually assigned to specified sections of the route.

The maintenance staff

An important part of the Thruway 'team' concerned with fire protection is the Maintenance Staff. The New York-Buffalo route is divided into four Maintenance Divisions, with 13 Section Maintenance buildings, strategically located.

In 1955 the Maintenance staff numbered 641. It is seriously concerned with safety along the vast route and its personnel and equipment are usually on hand at accidents and fires of any consequence.

Training in fire fighting

Inasmuch as Thruway Police and Maintenance personnel are the first to be involved in fire of an description on or along the Thruway, the Thruway Authority considers it essential that they be thoroughly trained for the task—at least for first aid fire fighting. Such a training program is being carried forward, utilizing where possible, the facilities of the Bureau of Fire, Division of Safety, Michael Prendergast, Director.

Continued on page 1020

Christiansburg, Va., firemen and forces from nearby towns, fight to confine stubborn fire that spreads through hidden spaces, with a loss of $250,000

Christiansburg Fire Spreads Through Concealed Spaces

Fire of undetermined origin ripped through two brick buildings in the heart of the business section of Christiansburg, Va., on May 28, destroying six concerns with estimated damage of $250,000.

The building in which the fire originated was built in 1914 with a brick front wall one and a half stories high, and a tin roof sloping to ceiling height in the rear; the side and rear walls were also of brick. This building housed the City Market grocery, Royal Cafe, Jennings Barber Shop, Ladies' Budget Shop and Smith & Jones Department Store. These establishments were separated by wood frame partitions covered with ornamental tin, and the ceilings were covered with the same material. The partitions only went ceiling high, thus leaving open the entire attic space above. There were no openings into this attic space.

At approximately 6:05 p.m., a passing motorist stopped in front of the City Market and shouted that the roof was on fire. The manager telephoned the alarm at once and within three minutes the first-due engines CFD No. 2 and CFD No. 3 were on the scene.

Engine 2 stretched a 2½-inch hose line to the nearest fire hydrant. Montgomery County Engine No. 1 stretched two lines of 2½-inch hose in the alley behind the building to the same hydrant to which Engine No. 2 was connected and hooked up also. Christiansburg Engine No. 1 backed in and stretched a 2½-inch line to a hydrant at the opposite end of the block.

The Jennings Barber Shop, Ladies' Budget Shop and Smith & Jones Department Store were heavily charged with smoke, but no flame was visible; smoke was pouring from under the roof and emitting through the mortar joints in the front brick.

An attempt was made at once to cut a hole in the roof and operate a cellar nozzle at that point, but the roof was too hot for the fire fighters and this idea was abandoned. A second 2½-inch line was run off Engine No. 2 and taken to the roof of St. Paul's Methodist Church which joined the involved building on the west. Christiansburg's Engine No. 3, not being a volume pumper, was not put to work at the outset but was held in standby. However, within ten minutes the fire had spread so rapidly that a 2½-inch line was run from a hydrant to feed this pumper and two 1½-inch high pressure lines were run from it to the fire.

This layout was operated for about two hours, then the supply line was changed from the hydrant to a portable pump operating from the branch.

A second alarm was sounded about ten minutes after the first, and the Radford Fire Department was called in. Radford dispatched one 750 gpm pumper, one 500 gpm pumper and a rescue squad. On arrival this force stretched a 2½-inch line about 900 feet to a hydrant in the next block.

The Blacksburg Fire Department arrived a few minutes later with Montgomery County Engine No. 2, a 500 gpm pumper and a rescue squad. They stretched a 2½-inch line through the alley in the rear of the building to a hydrant at First and Franklin Streets, a distance of about 700 feet.

By this time, the roof had fallen in and the heat was so intense that the hose line on the church roof had to be removed. This was successfully put to work in the street cooling the church wall. The church suffered no damage. A small stream running under Main Street, which was catching most of the water runoff from the fire, was dammed up in the rear of the Richardson Funeral Home directly across the street from the fire, and a 750 gpm pumper from Radford Arsenal which had arrived, was put to work, pumping from this branch. The Salem, Va., Fire Department sent one pumper which was kept on standby in case of another fire call. Despite the nine hose streams being operated on the fire, it spread through the wall into the Smith Building occupied by Interiors by Richard. Although this building had a 12-inch brick wall, the floor and ceiling joist extended through the wall and the structure was on fire between the second floor and roof before anyone realized it.

The Radford Arsenal pumper supplied one 2½-inch line which was directed on the Angle Building. Another 2½-inch line was run from CFD Engine No. 1 onto this building and this stream was directed into the second floor windows of the Smith Building on the east side. Brown's Drug Store, which was between the Smith Building and Angle Building, suffered severe water damage as part of the side wall fell onto the drug store roof, breaking it and allowing water to run into the store below.

The spread of the fire was checked at the Smith Building after it was completely gutted. At about 9:30 p.m. the blaze was considered under control and the fire forces from other towns were released.

In addition to the before-named departments which sent pumpers, rescue units with light plants and additional men, help came from Fairlawn, Pearisburg, Pulaski and Salem. A pumper was also sent from Bland but this was not placed in service.

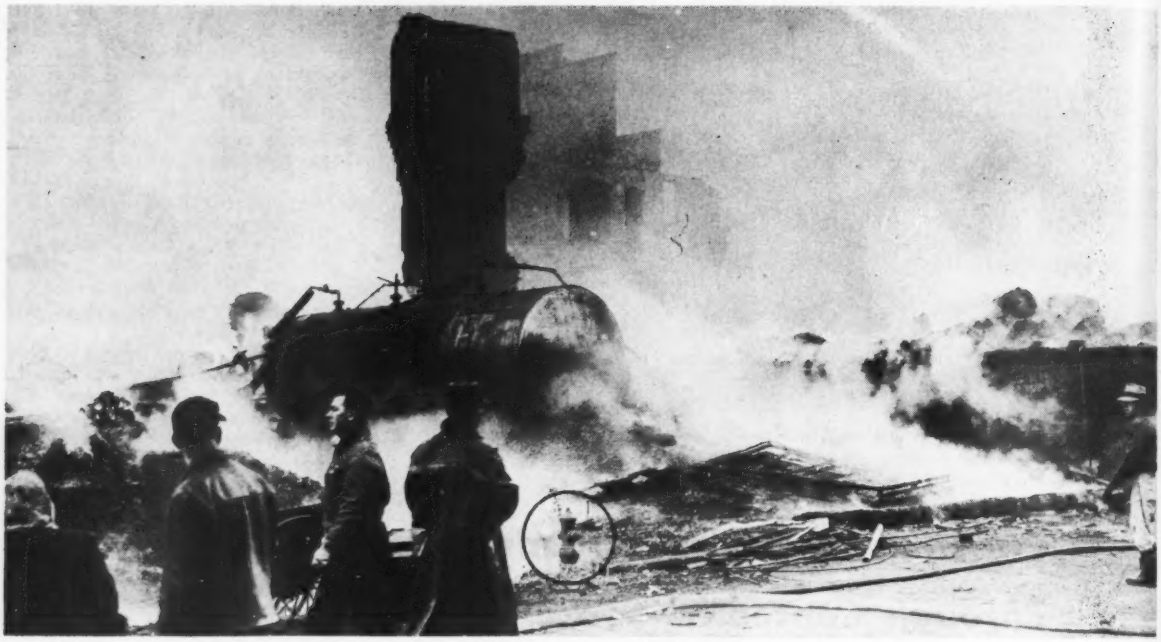
Christiansburg firemen continued to pour water into the smoking ruins for the rest of the night and a standby hydrant line was left hooked up to a hydrant for three days to extinguish any outbreak of fire.

Radio plays important part

The Christiansburg Fire Department consists of four pieces of equipment manned by 25 volunteers. Engine No. 2 is a 500 gpm Oren-Dodge; Engine No. 1 is a 1930 500 gpm American La-France; Engine No. 3, the newest, is a one-ton Oren-Dodge with 200-gallon tank and high pressure pump. The last named carries miscellaneous equipment and is first out on all fire calls. Montgomery County Engine No. 1 is a 500 gpm Oren-Ford and is used on county fires but operated by the Christiansburg Fire Department. Radio played a very important part at this fire in calling in aid and placing incoming apparatus.

Christiansburg Fire Chief, C. Fred Blount was in command of operations. He was ably assisted by Chief Walter W. Carden of the Radford Fire Department, Chief L. A. Ballard of the Salem Fire Department, Chief Atlee Frazer of the Blacksburg Fire Department and W. T. Hurd of the Radford Arsenal Fire Department.

James H. Blount, Secretary
Christiansburg Volunteer Fire Dept.



Abandoned hydrant stands alone and unused amid ruins of the Garden State tannery buildings

Large Force Lacking Master Streams Fights Costly Fire

FLAMES RACING THROUGH six huge buildings of the Garden State Company tannery at Pine Grove, Pa., on Saturday, May 19, completely destroyed the town's only industry, with a loss estimated at more than $2,000,000, and the destruction of practically all company records.

Mute testimony was born by a sign above a burned-out doorway stating, *Do NOT Smoke—a fire here may close this plant and put its employees out of work.* A total of 340 townspeople learned the truth of the notice; the weekly payroll was $30,000.

Firemen from 14 communities within a 25-mile radius vainly fought the initial blaze. In many sections of the plant, the fire simply died out several days later from lack of fuel.

Fire fighters were at times driven back from the structures as much as 200 feet, beyond the reach of streams from 2½-inch hand lines. There were no deluge sets available, hence no master streams could be put into play, although water supply was unlimited. The regrettable truth is that water could not be used effectively on the inferno until at least 12 hours after the outbreak, when hose lines could be operated close enough.

By JOHN D. KLINEPETER

Pine Grove, a town of only 1,300 population, is located about 40 miles northeast of Harrisburg, Pa., and 22 miles west of Pottsville.

The tannery supplied finished leather for automobile upholstery, handbags, shoes, wallets, etc., throughout the eastern United States.

Four employees were on duty early Saturday morning at the plant when Assistant Fire Chief Solomon Barr, a plant foreman, was notified by telephone that a small fire was visible in the buffing and pasting room in the north wing of the sprawling plant.

He immediately drove two blocks from his home to the plant, and ran to the section with two soda-acid hand extinguishers, but was forced back by smoke. Flames were invisible in the smoke.

The night watchman called Chief Barr's fire company, Pine Grove's North End Company, and notified the town taxi service to trip the alarm at the community's South End Company.

It was 3:15 a.m. when Chief Barr was called at home; the first alarm to the North End Company was logged at 3:25 a.m.

Six minutes later, North End Chief John Kramer was mounting a ladder to reach the roof of the involved north wing with a 2½-inch line, but before he could bring it into play, he was forced to retreat; the ladder was left there and burned.

Flames roared through the three-story building, fed by hundreds of barrels of lacquer, paint, paint thinner, chemicals and an oil trademarked "Tanoyl." Within half an hour two adjacent buildings of the same height were involved.

So rapidly did the fire spread that the plant's entire six buildings were doomed within an hour.

Heavy reinforcements called

Calls for aid were issued via the town's telephone switchboard operator, bringing pumpers from Cressona, Summit Station, Suedburg, Ravine, Cherry Station, Tremont, Bethel, Lebanon and Williamstown to aid the two Pine Grove companies. Shortly afterwards, Schyulkill Haven dispatched three pumpers, Minersville two and Tower City one. The Tower City pumper burned out a bearing enroute, and was never used at the fire.

At 9 p.m. Saturday, three Pottsville companies were dispatched, with the first

master stream equipment made available.

Other than Pottsville units, all pumpers working at the fire were of 500 and 750 gpm capacities.

Direction of operations was divided among Chief Kramer and South End Chief Albert Lininger, in the absence of town Fire Marshal Harold Snyder, who arrived on the scene late Saturday evening. Under his orders, the Pottsville aid was immediately requested.

Fire foils hydrant use

The first five incoming fire companies connected to hydrants within a two-block radius of the plant, and another drafted from a small stream that intersects the town. No relays were set up, but each company chief selected a location as near the blaze as he could and pitched in with whatever equipment he had at his command.

The plant was surrounded with seven hydrants, three in front on 6-inch mains, and four at the rear on 4-inch branch lines.

These mains were in turn served by the town's 8 and 10-inch mains, from three reservoirs located at three-mile intervals for nine miles, with a total capacity of 23 million gallons of water.

The static pressure, according to the town water engineer, was 90 pounds at the hydrants. Local pumpers first in attempted hookups at two of the three hydrants in front of the plant area along the double track Reading Railroad line. This spot was soon untenable, and at this stage the firemen lost the services of the 6-inch interior main which served the machine shop.

Plumbers dug up the street in front of the plant to blank the connection to the factory main. Under cover of water curtains from fire hoses, water company men made a temporary connection to permit use of the three hydrants in front. But firemen were driven back by intense heat before these hydrants could be put into service. However, the move did prevent a solid 6-inch stream of water from draining valuable water from the remainder of the town's supply.

From then on, incoming companies took stations along the Swatara Creek, which in places runs within 75 feet of the fire area. The companies drafting water from this creek however were seriously handicapped by smoke, as the wind drift was in their direction. Fire units coming in on Route 443 east of Pine Grove, were also slowed by the dense pall of smoke that hung like a heavy fog for 11 miles.

An estimated 22,000 feet of hose was used during the battle which continued until Wednesday afternoon, May 23.

Other fire companies summoned from Auburn, Reinerton and Orwin assisted in covering the town which was endangered by flying sparks. The six companies locating by town hydrants and the small creek in the town (not to be confused with Swatara Creek) not only supplied lines to the plant, but operated smaller lines to wet down homes and roofs in the area. Homeowners used garden hoses also to good advantage.

The temperature of the air one block from the blazing plant at the height of the fire was recorded at 110 degrees; a block farther it was 100 degrees at the level of house roofs.

Numerous brush and field fires were started by flying sparks east of the plant, and women, Boy Scouts and all available manpower that could be mustered were put to work raking, wetting and tramping out these spot fires.

Not until these surrounding fires were controlled could the town's ladies set up soup and sandwich kitchens to feed the estimated 600 firemen and townspeople engaged in the operations.

No sprinklers

The six tannery buildings were unsprinklered, but had been fitted with numerous hose reels from wall pipes and rolls of single jacketed 1½-inch linen hose. Additional movable hose reel carts with 2½-inch hose were stored at locations about the plant. None was ever used.

At its greatest length, the collection of buildings stretched a bit over 1,000 feet, north to south. The greatest width was slightly under 500 feet. All six buildings were connected by ramps and runways, and at least four brick fire walls were in evidence in the ruins, but these proved ineffective in halting the spread of the fire. According to eyewitnesses, the flames apparently spread across roofs, then burned downward into the buildings. Open second and third floors furnished unbroken travel for the fire, and the highly flammable contents spread the flames, according to one observer, "faster than a man could run."

Numerous explosions occurred sending portions of walls flying in all directions.

Complete extinguishing operations were delayed nearly two days when firemen were held at a respectable distance by the threat posed by a huge acid tank containing 300 barrels of highly flammable materials, located in the main portion of the factory. This tank, however, had not ruptured by Wednesday, but firemen were held back because of the corrosive nature of the contents.

Fortunately no firemen required hospitalization for injuries, although 18 were treated for minor burns and injuries by the Tremont Miners' ambulance crew.

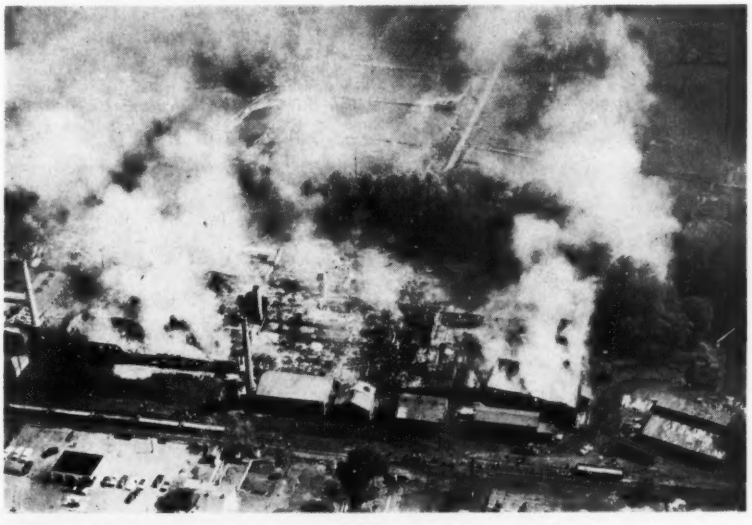
Each of the buildings housed a separate operation of the plant; five additional buildings contained carpenter shops, power station, offices, boiler room and storage departments. These were located outside the perimeter of the main collection of structures.

Three of the four farthest removed buildings to the front of the factory, including the carpenter shop and power station, were gutted. The boiler room was badly damaged. A storage shed at the southeast corner was saved, as were a boiler room and a huge building to the north undergoing remodeling. Four railroad cars were burned. Two tannery trucks were saved, but these were just about all that could be salvaged. Approximately 775,000 feet of finished and semi-finished leather were destroyed and 35,000 steer hides stored in the hide cellar awaiting processing were damaged beyond salvaging. More than 300 barrels of chemicals were destroyed by the fire, as well as scores of technical machines used in leather processing.

Chief Barr said he could not determine the cause of the blaze, because of the complete destruction of the factory. He discounted the possibility of careless smoking, as factory workers strictly adhere to the "No Smoking" edict.

The firm was originally started in 1906 as the Pine Grove Tanning Company. It closed in the late 1940's and was reopened in 1950, when a community-wide public subscription drive raised sufficient capital to open the plant. Most townspeople are still stockholders in the organization.

At the time of the fire, the tannery was undergoing a $100,000 remodeling campaign. Authorities have announced that the company will rebuild. □□

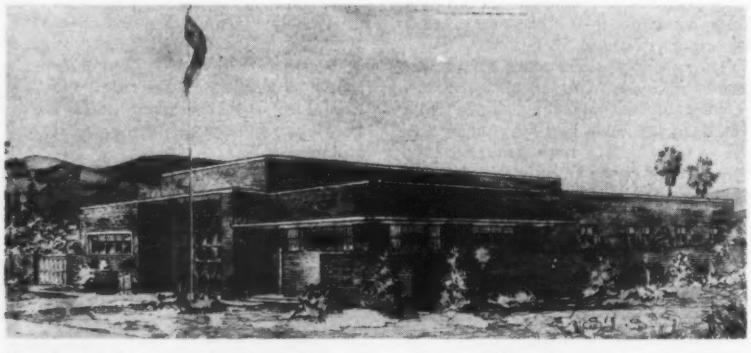


Bird's-eye view of burning tannery buildings showing broad extent of fire involvement, necessitating long hose stretches and extensive fire fighting facilities

Burbank, Cal., Fire Department's improved program includes this new headquarters house and two substations. This structure cost $425,000, has radiantly heated floors—*Photo courtesy Prescott & Whalley, Architects*

Fire Service Maintains Steady Building Pace

Newest fire stations incorporate smart, functional design, modern construction materials and latest comfort and convenience features.

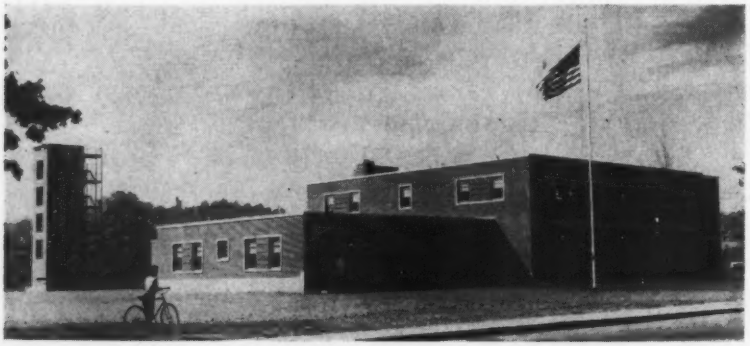


Los Angeles fire station project includes 27 new houses under a $4 million bond issue, of which this $125,000 Station No. 91 in the Sylmar District of the San Fernando Valley, is typical. All are the last word in appearance—*Photo courtesy of Los Angeles Fire Department*

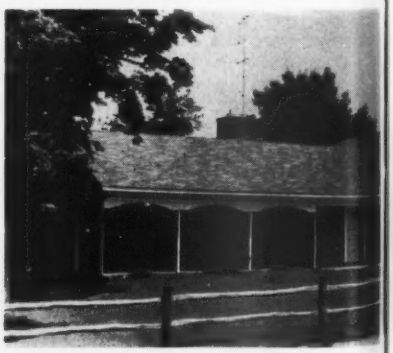
Evidence of progress in the nation's fire service is found in the building programs of fire departments large and small.

Notwithstanding increasing costs of all materials and services that enter into the erection of new fire stations and fire alarm headquarters and the rehabilitation of old structures, building is increasing in volume and value.

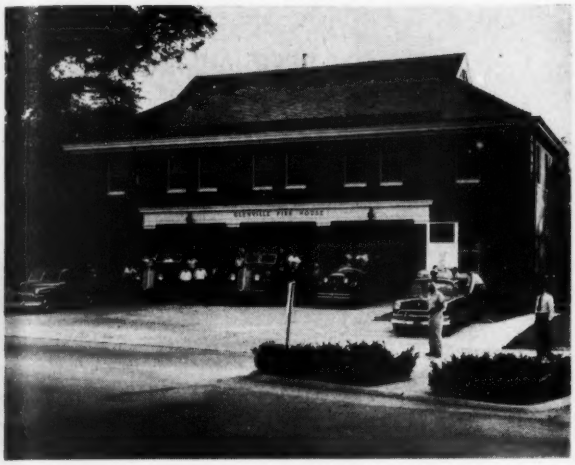
The fire station is the fire fighter's



The Worcester, Mass., Fire Department recently opened this new headquarters and training building which cost $234,000. The two-story cellar-less structure includes offices for chief and deputies, workshop and room for three fire companies—*Photo by Charles Cocaine*



Valhalla, N. Y., Fire Company No. 1 recently occupied this attractive new home designed to conform to the general architec-

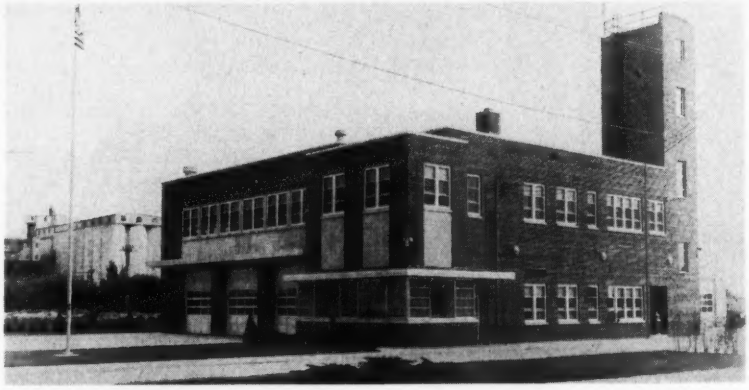


Above left: Glenville fire station, Town of Greenwich, Conn., protects a growing surburban area. It combines meeting and recreation facilities with a roomy apparatus floor, watch office, storage space, etc.—*Photo courtesy Greenwich Fire Department*

Above right: Newton, Mass., Elliott Street fire station and training ground, one of two new houses incorporating the latest innovations in architecture and construction
—*Courtesy Gustav A. Hagen, Architect*

business and professional home. It is also a measure of the esteem in which he is held by the public and the civic administration he serves.

This fact is now becoming recognized by both municipal officials, and architects and builders who serve them. Proper official environment means better, more efficient firemanship and this in turn is reflected in lower fire frequency, and losses.



West Milwaukee, Wis., Fire Department boasts this newest station. Located in a business area, it incorporates training tower and features such as glass-enclosed office and large airy dormitory—*Photo courtesy West Milwaukee Fire Department*

Philadelphia Fire Bureau has dedicated a dozen new stations such as this of Engine 18 in North Philadelphia, since 1954, and many more are on the drawing boards. The Bureau believes in clearly identifying its houses—*Photo courtesy Philadelphia Fire Bureau*

tural motif of the village's public buildings. Station is located in a residential neighborhood —*Courtesy Charles D. Grable, Architect*

Lewistown, Me., Fire Department's all-on-one-floor residential area substation makes liberal use of masonry, brick and glass, with emphasis on comfortable living and working quarters. Note absence of hose tower—*Photo courtesy Lewistown Fire Department*

FIGURE 1—*Los Angeles Fire Department photo*

OVERHAUL AND SALVAGE . . . IN THEORY AND PRACTICE

By ROI B. WOOLLEY

PART XVII

Getting Rid of Water by Means of Drains, Dikes and Chutes

THERE ARE FIVE GENERAL METHODS of removing large quantities of water from the upper floors:

1. By means of stairways
2. By means of elevator or other shafts
3. By opening made from floor to floor
4. By chutes to the outside of building
5. By means of building drains and/or scuppers and breaching walls

Some of these methods involve the use of salvage covers in one way or another. This chapter is concerned with these operations.

The chief objectives in water removal operations are (a) speed; (b) safety to men and equipment; (c) minimum damage to building and occupancy.

Some of these methods may involve the use of salvage covers in one way or another and it is our purpose at this time to discuss the more important of these operations.

As has been pointed out in earlier chapters, efficient salvage work calls for removal of superfluous water at the earliest possible moment, with least damage to the building involved and its occupancy, and with the minimum of effort and salvage materials on the part of the salvagemen.

There is no set method or procedure for ridding a structure of water accumulation any more than there is for extinguishment of a fire in the structure. Salvage procedures, like fire extinguishing operations, must be tailored to fit the situations encountered.

This chapter has to deal with water in motion, that is, the collection and movement of surplus water either to the outside of the involved building, or to locations where it will do the least damage. We are dealing with operations necessarily related to serious fires, where considerable water was used in fire control and extinguishment, and where normal catchalls cannot contain the overflow or runoff.

Let us first consider the question of chutes.

Stairway chutes

Stairway chutes have a dual purpose: (1) to serve as drains for disposal of water by means of the stairways, and (2) to protect stair coverings or finishings against damage resulting from the movement of fire and salvage personnel during their work.

Stairway chutes can be improvised on the spot, or covers can be prepared at the fire station or salvage patrol headquarters and carried on the apparatus, made up and ready for immediate use.

What with the present shortage of men to perform salvage work, and the hurry of getting protective coverings over perishables or damagable materials, particularly in households, there is a natural tendency to overlook covering stairways until all other covering tasks have been attended to. By this time, dirt and debris may be well tracked into the stairway furnishings.

It is not always easy to bear in mind the fact that when working in residences, even if the stairway is not to be used for routing water from the premises, it is good policy to cover the treads with a form of chute or drain. This extra bit of effort may ruffle some salvagemen and firemen who are impatient with these "added touches," but the grateful appreciation of the distraught householders who witness such care by the misquoted "water squirters" and "axe wielders" is good public relations of the highest order.

However, inasmuch as the stairways

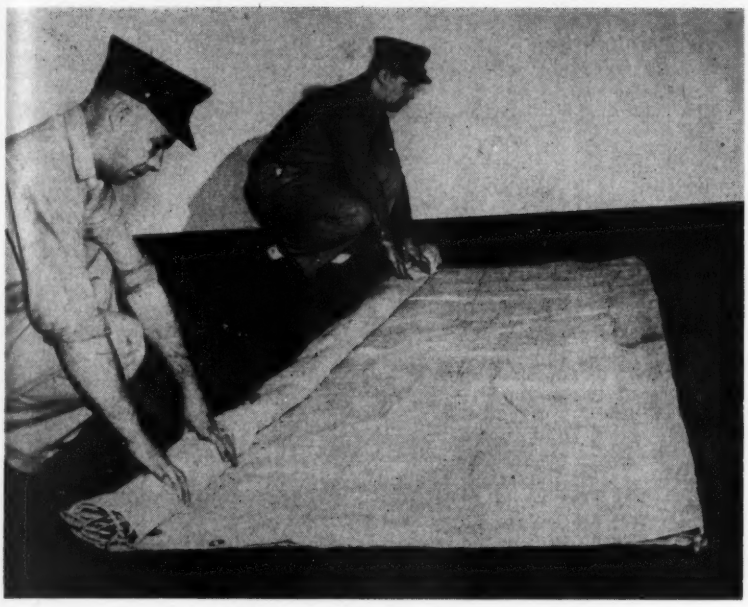


FIGURE 2—*N. Y. State Div. of Safety photo*

of a building are usually the avenues taken by excess water employed in fire fighting, an early size-up of their location, construction and relation to the fire, as well as to other means of water egress, is in order by the salvage officer in charge.

When water is or may be directed down stairways, in most cases covers should be opened to half their width and spread on the stairs with ample side elevation or roll, together with well-sealed or lapped connections where more than a single cover is called for.

Los Angeles stairway drain

The accordion fold described in chapter XV, affords a simple method of making stairway drains without additional preparation. Any length of stairway may be covered but the directions given here are for a stairway that requires two covers. Two men carry covers to the stairs. One man carries a cover to the top of the stairway, leaves it on the landing and returns to the center of the stairway. The second man at the foot of the stairs throws the cover to the man in the center using the one-man throw (see Part XV). Both men open the cover and secure to the hand rails or wall using "S" books, nails, salvage cord, rope or chain.

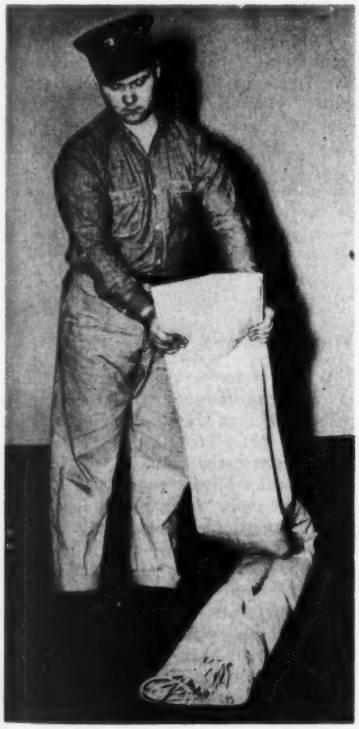
The first man returns to the top of the stairs and using the one-man throw throws cover to man in center of the stairway (Fig. 1). Both men open the second cover as previously stated, and secure it in place. The edge of the upper cover overlaps the lower one in order to prevent any seepage at that point. The top edge of the upper cover should be placed under the lip of the top step. In case the step has no lip, place sawdust on the step, lay cover on the sawdust and bind in place with a cleat (lath).

The one-man throw fold as shown in Chapter XIV may also be readily adapted for a chute by merely unfolding to cover the desired location. Splicing and securing may be done in the same manner as for the accordion fold.

Prepared chute

Some squads prefer to carry chutes already prepared from standard covers or to prepare them on the scene as needed. The operations described in the following may be done at the station or on the spot at the fire scene.

A cover is laid out flat and two men then roll the long edges in to the center line (Fig. 2). When the cover is in two narrow rolls it is then folded in thirds,



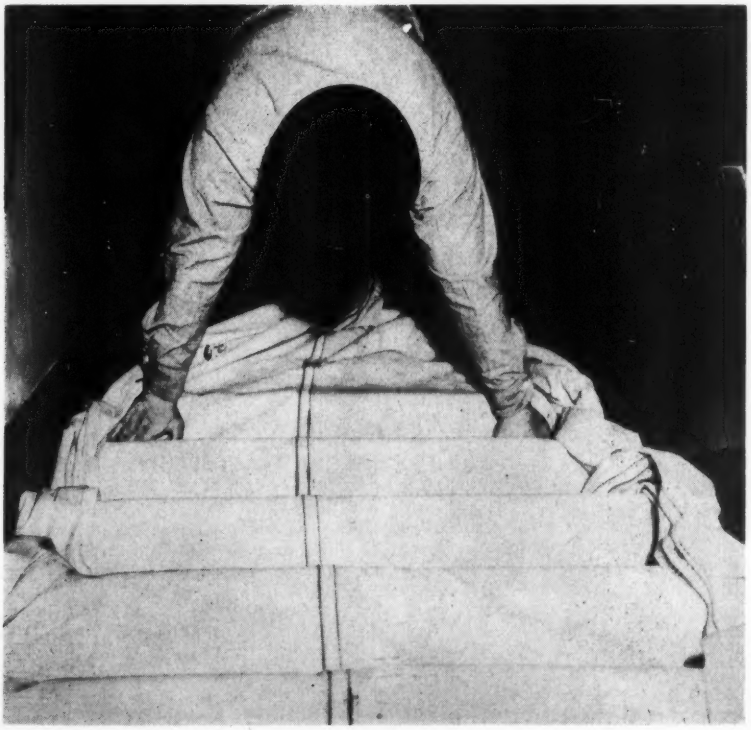


FIGURE 3 and FIGURE 4 —*N. Y. State Div. of Safety photos*

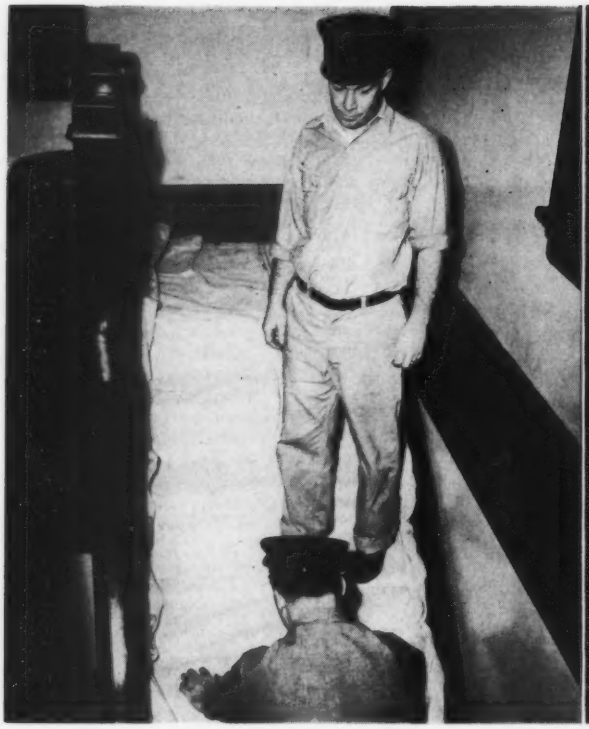


FIGURE 5 and FIGURE 6—*N. Y. State Div. of Safety photos*

or smaller as convenience dictates (Fig. 3). It is carried to the point of application and laid in to position, starting at the top of the stairs.

One man stands on the end of the cover as an anchor while the second man spreads the cover to the desired width and tucks it in at each step. Tucking prevents tearing or displacement as men walk over the cover in climbing or descending the stairway (Fig. 4). The anchor man decends a step at a time as the other man tucks in the cover (Fig. 5). If necessary to use several covers to protect the stairway, the chute is spliced by overlapping several steps and tucking the rolled edges together as shown in (Fig. 6).

Some squads use a similar method for preparing stairway drains but the covers are made up on the spot and a sufficient number are spliced together by rolling the edges, with a good overlap in the direction of water-flow. The entire chute is then carried to position and laid down in one motion.

If it is necessary to direct the water from the bottom of the stairs to a designated exterior, dikes of sawdust can be effectively used. If the floor is concrete, sawdust alone may be called for, but if wooden floors are present then covers are spread in the same manner as chutes and the rolled edges banked up with dikes of sawdust. This will permit directing a considerable volume of water to the exterior and any splash or overflow will be absorbed by the sawdust (Fig. 7).

FIGURE 7 —*Photo courtesy Underwriter's Fire Patrol, Kansas City, Mo.*

Window chutes

Where water is leaking from ceilings in close proximity to windows the pike pole drain can be used effectively as shown in (Fig. 8).

To prepare the chute in this manner first spread a salvage cover flat. Then lay two pike poles along opposite sides or ends at any desired angle, with the handles extending past the cover. Then insert the points of the pike pole hooks through the top grommets and fold the edge of the cover down far enough to clear the hooks. If the grommets are too small to admit the point, tie with rope or cord. Lap the cover over the poles and roll the poles and cover toward the middle until the desired width is obtained. The chute is then placed in position and anchored

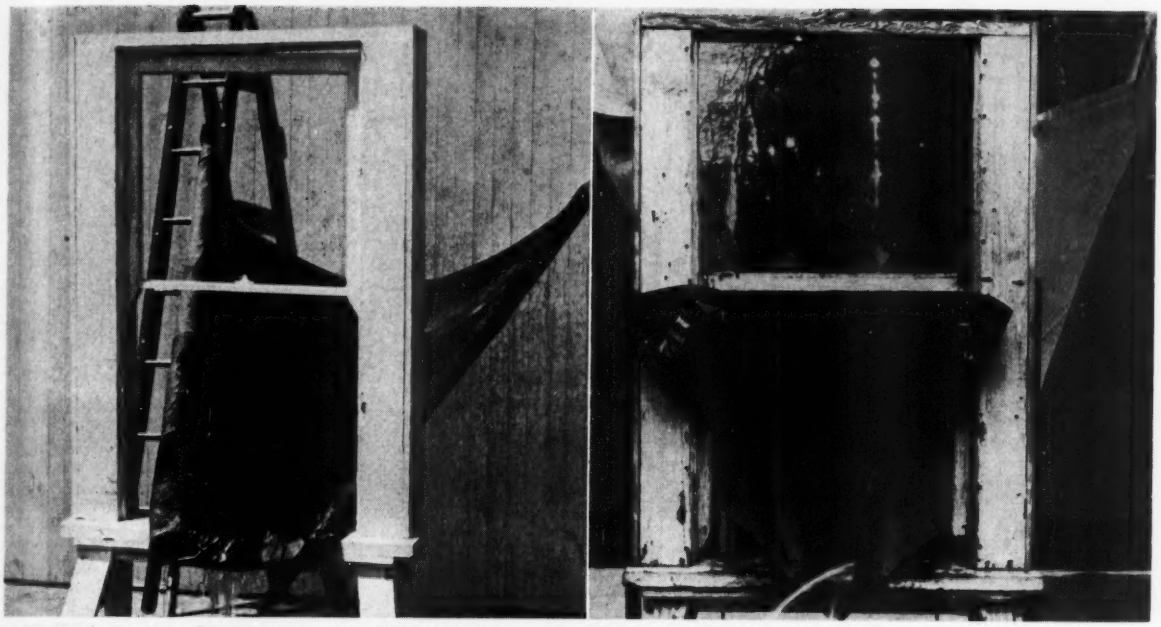
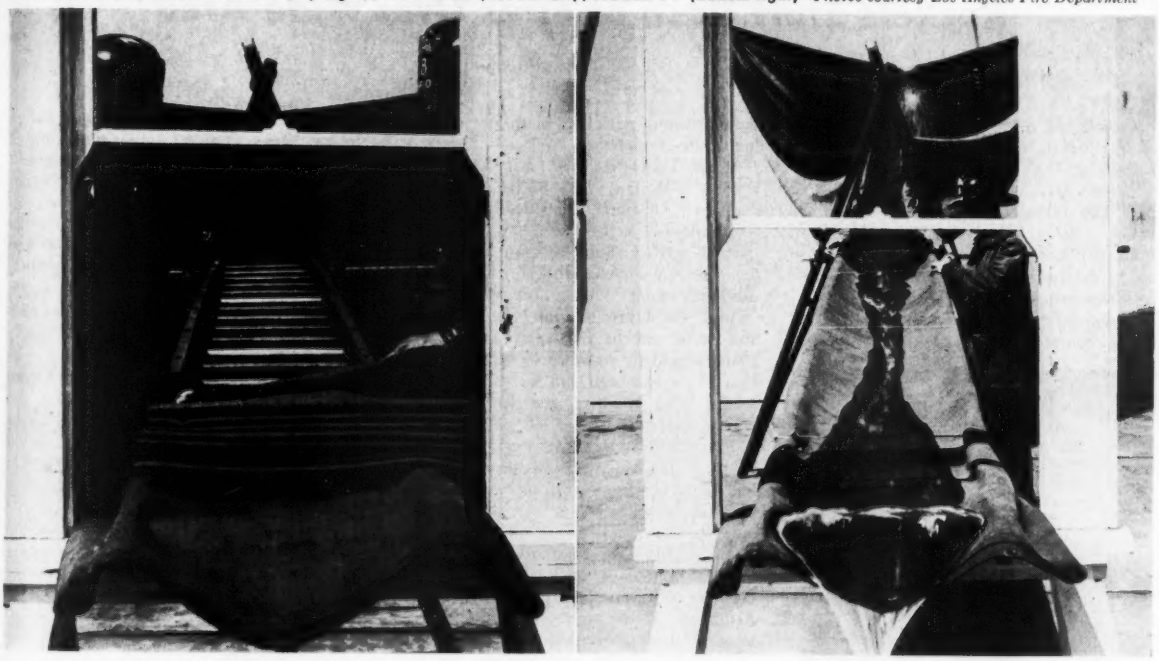


FIGURE 8 (top left); **FIGURE 9** (top right); **FIGURE 10** (bottom left); **FIGURE 11** (bottom right)—*Photos courtesy Los Angeles Fire Department*



in place at the top by placing the hooks of the poles over rungs of ladders, pipes, pieces of furniture, or by driving the points of the poles into the ceiling. The handle ends of the chute are placed outside of the window and the water directed to the exterior by this means.

Another style of window drain for use where the water is coming down close to a window is shown in (Fig. 9). The cover is secured to the window sill by nailing through the center grommet. The grommets on the same side of the cover are then fastened to the window frame and the cover is drawn taut and fastened by means of "S" hooks, nails, ropes, or the like, under the opening in the ceiling. There should be a slight sag in order to form the chute. If necessary to support the edges between the window and the fastening near the ceiling hole, pike poles can be used by placing the point of the hook through grommets and propping the poles upright.

Where leaks occur some distance from the window the ladder drain is popular. A straight ladder is placed so that one end extends out the window. The other end is placed in position to catch the water and elevated at some angle to speed the water out the window. It may be placed on an improvised stepladder support or a high piece of furniture.

A salvage cover folded accordion width is placed on the ladder (Fig. 10), parallel with the rungs, and is then unfolded lengthwise of the ladder, starting at the end extending out the window. The cover is secured to the ladder with salvage cord. If necessary, several covers may be used in the same manner and spliced by allowing sufficient overlap where they join. Another cover can be hung from the ceiling to form a sort of catchall chute and spliced to the ladder chute to catch the water and direct it to the proper escape path as shown in Fig. 11.

It will be quickly noticeable that the accordion fold is ideal for constructing chutes in this manner due to the simple

Continued on page 989

Los Angeles County fire fighters control threatening oil sump fire and woods blaze along Highway 6 near Newhall, Cal., in one sector of 50-mile area "bombarded" by rockets from two Air Force interceptor planes in wild pursuit of pilotless Navy drone plane

Rockets Start Rash of Fires Over Wide Area

One of the most freakish series of fires in the history of the West broke out in Northeast Los Angeles County on the afternoon of Thursday, August 16.

It was reminiscent of another series of blazes touched off by a blazing airplane from which 21 chaplains parachuted to safety in the same area last year (FIRE ENGINEERING, November, 1954).

Residents of a 50-square mile area suddenly found themselves under rocket bombardment with fires seemingly springing up everywhere.

Captain Daniel Talbot, Chief Fire Investigator, Los Angeles County Fire Department, examines one of exploded rockets in Placerita Canyon near Newhall, Cal. Note scorched brush and trees in rear. Oil refinery was threatened and several sumps set afire by 208 Air Force rockets

—L. A. County F. D. photo

Miraculously no one was hurt as a total of 208 Tiny Tim 2.75-inch rockets from two Air Force F-89 Scorpion jet interceptors fell to the earth.

It all started shortly before noon when an electronically-controlled drone plane used in testing at the Navy Missile Test Center, Point Mugu, broke its "shackles" and went out of control. Normally the plane would fly seaward from the Pacific Coast base at Mugu, but instead it veered inland over Ventura and Kern County and Santa Susana Pass.

Meanwhile, the Navy informed the Air Force of the runaway and two interceptors from Oxnard Air Force Base scrambled to shoot the aircraft down over open country.

At 30,000 feet the jets found the old drone flying along near Castaic over the Old Ridge Route. The two highly trained Air Force crews were unable to hit the World War II propeller-driven Hellcat despite their barrage of rockets and finally it crashed in flames near Palmdale in the Antelope Valley, after running out of gas.

Three good-sized fires started, in addition to numerous blazes that were quickly extinguished and never reported to fire departments.

Before the afternoon was over, every available Los Angeles County fire company and United States Forest Service unit, plus mutual aid companies from Los Angeles City, Ventura and Kern Counties, and six fully-manned OCD triples, rushed into the area to control the Air Force's folly.

The first alarm reached the L. A. County Soledad Control Center at Newhall at 1:11 p.m. as a brush fire seven miles north of Castiac, near the Old Ridge Route. Three county engines with patrols and U. S. Forest Service units moved in under command of Assistant Chief J. D. Barton, Division IV.

Because of the high fire hazard in the area, automatic third alarm calls had additional county companies rolling from Malibu, La Canada and West Hollywood. It was a good move, too, because at 1:25, as one dispatcher put it, "All hell really exploded!"

Calls started piling in, reporting that an oil refinery had exploded and that the highway was buckling and general chaos was taking place near Placerita Canyon and Highway 6 in the Newhall District, about 15 miles southeast of the original call.

At that time it was not known that the jets were causing the fires, but Deputy Chief John Duncan, in command of the big L. A. County department during Chief Keith Klinger's absence on business, knew something unusual was taking place.

Equipment en route to the Castaic blaze was rolled directly to the Placerita scene, bringing 12 county engines, 6 OCD units, 4 patrols, 3 bulldozers, a 1200-gallon tanker, all the rookies from the Cecil R. Gehr Training Center aboard a modern training pumper, 200 men from 6 camp crews and 6 tankers from L. A. City.

Assistant Chief Harvey T. Anderson, Division III, took command as workers reported that rockets were falling among them while they ducked shrapnel.

The combined forces worked desperately to keep the flames from destroying the Newhall Refinery, oil installations and tanks in the area. Several sumps were set on fire. In its wild progress, the fire

burned over 105 acres of land before the weary crews controlled it at 4:30 p.m.

Back at the Castaic blaze, the fire fighters were making gains and that blaze, too, was stopped at the same time.

The third and largest fire was reported to the U. S. Forest Service at 3:05 p.m. near Mount Gleason in the Angeles National Forest. Defense installations are in this area as well as valuable watershed and recreational lands.

Burning in rugged terrain, the fire devoured more than 300 acres of heavy brush before it was controlled the next day.

The U. S. Forest Service had 350 men, 4 tractors, 15 tankers and 2 helicopters, as well as 4 county engines and 1 patrol under Ranger Bill Dresser, in action.

Another small fire came within 100 yards of the Bermite Powder Co. plant in Saugus and city firemen controlled still another blaze near Chatsworth after a two-hour battle.

Numerous residences of Palmdale reported rockets exploding in the road as they drove and said shrapnel was bouncing off radiators and fenders. Several rockets exploded near the Yucca Elementary School in Palmdale.

County officials protested to the Air Force, pointing out it was difficult to understand why two modern jets with radar sights and carrying 208 rockets, couldn't bring down an obsolete airplane.

Brig. General James W. Andrew, commanding the 27th Air Division, ordered a complete investigation of the fiasco, but as yet no report has been released.

Civil Defense officials pointed out that this type of disaster could easily occur in war emergency fire fighting. During the emergency, COD triples from South Gate, Whittier, Glendale, Arcadia, Inglewood, South Pasadena, and L. A. County were called to service.

L. A. County ordered a complete recall of all chief officers and reserve rigs were manned on a standby basis. The longest response was County Engine 145 from Lakewood, a distance of approximately 75 miles.

Equipment from the Ventura County Fire Department moved in to cover L. A. County stations in the Malibu district. The county also dispatched additional equipment direct to the fires. Kern County also rolled a half dozen rigs for cover-up and standby use.

Cliff Dektar

Colombia Blast Causes 1300 Casualties

An unaccountable explosion of six dynamite-laden trucks on August 7 brought death or injury to over 1,300 persons, turned two square miles of densely populated downtown Cali, Colombia, into utter ruin, causing property damage estimated as high as $40 million.

The actual number of dead will probably never be known. On August 11 the identified dead numbered 403 with 14 missing military personnel and others unaccounted for. In hospitals were 873 persons. Unofficial estimates place the number of fatalities at close to 1,000.

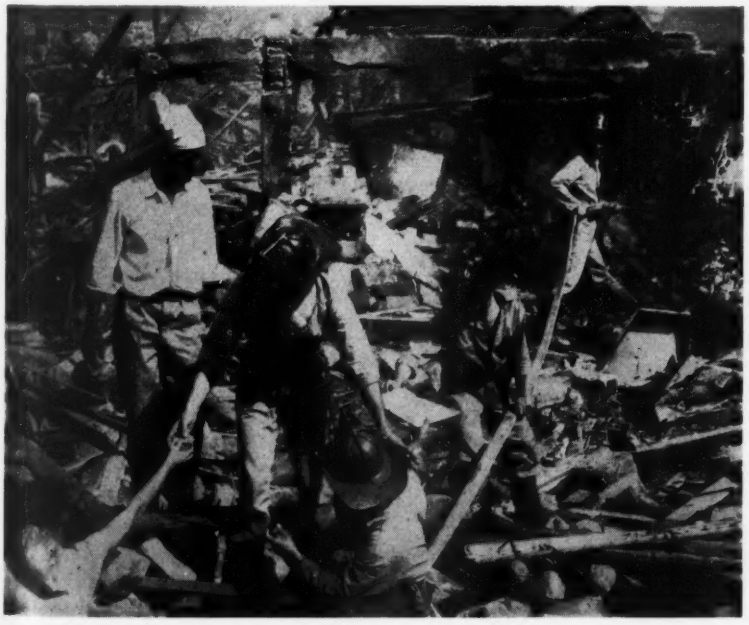
The six trucks were part of a convoy of ten, it is said. Each was loaded with five tons of commercial dynamite destined for Cali construction work. The dynamite was packed in wooden boxes and was shipped from Buenaventura, arriving in Cali on August 6. Cali, an industrial city of between 300,000 and 450,000 persons, is the capital of Valle del Cauca Department.

The trucks, for some unexplained reason, were permitted to park next to the Army barracks housing a large contingent of military personnel, and close to the depot. Five of the trucks were parked against a wall of the barracks buildings and one was parked behind them. Sentries reportedly guarded the whole area and soldiers were sleeping on the trucks.

Experts said dynamite packed in wooden boxes could not have exploded accidentally by itself. They said it was unlikely that a cigarette smoked near or even aboard a truck could have set off the blast. Therefore, they suggested everything pointed to a deliberate triggering of the dynamite charges.

The blast of the 30 tons of dynamite came at 1:20 a.m.; it pulverized the trucks, left only some steel supports of the barracks building and a deep hole 200 feet by 80 feet deep. Roofs of concrete structures were caved in and walls toppled over an eight-block area, with serious damage to other buildings beyond that.

Fires started but were soon controlled by firemen who joined with soldiers and hundreds of volunteers in the efforts to reach the dying and the dead. Bulldozers and earthmovers were employed to move debris. First aid stations and field kitchens were set up and medical help was dispatched to the stricken city from throughout Colombia. The United States flew in Red Cross teams and tons of plasma and antibiotics.



Firemen search for victims and fight fires following unexplained explosion of 30 tons of dynamite that caused over 1300 casualties and $40 million property loss in Cali, Colombia

Minnesota Governor Calls Fire Conference

Alarmed by the growing number of fires, fire losses and fire casualties occurring in Minnesota city and farm homes, Governor Orville Freeman called an all-day conference on Fire Prevention in Minneapolis July 31.

More than 700 fire chiefs and fire prevention experts attended the session at the American Hardware Mutual Insurance Company Building, Calhoun Knoll.

Aiding the Governor in setting up the conference were the International Association of Fire Chiefs, Minnesota Fire Chief's Association, American Hardware Mtual Insurance Company and the office of the State Fire Marshal.

In issuing the conference call, Governor Freeman declared:

"Minnesota fire losses generally in 1955 were lower than those in 1954. However, 1955 home fire losses were higher than those in 1954.

"The same story is true of deaths and injuries from home fires. We must concentrate on fire prevention in the home and on the farm to save this growing loss in lives and property."

Conference moderator was Dr. J. O. Christianson, director of agricultural short courses at University of Minnesota.

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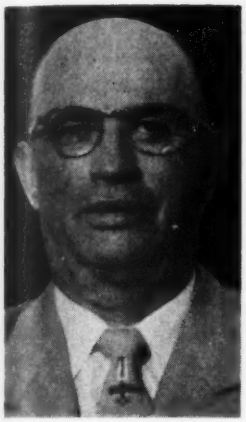

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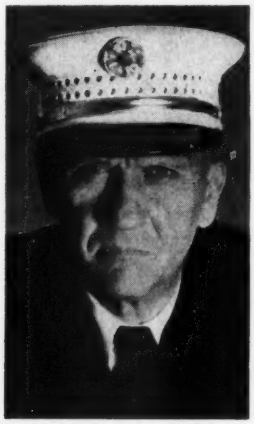

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TENTATIVE PROGRAM

I.A.F.C. Conference, Miami, Fla.

Sunday, November 11

9:00 a.m. Registration—Biscayne Terrace Hotel
2:00 p.m. Board of Directors meeting
2:00 p.m. Southeastern Association meeting, Everglade Hotel
2:00 p.m. Great Lakes Association meeting, Alcazar Hotel
2:00 p.m. Missouri Valley Association meeting, Columbus Hotel

Monday, November 12

9:00 a.m. Registration—Dinner Key Auditorium
10:00 a.m. Open meeting and Memorial Services
12:00 noon Adjournment for lunch
1:30 p.m. Business and technical session
2:15 p.m. **Current Developments in Fire Waste Control**—Percy Bugbee, General Manager, NFPA
2:30 p.m. **Integration of Fire and Police**—panel discussion with Chief Wayne E. Swanson, Moderator; William J. Veeder, Jr., City Manager, Fort Lauderdale, Fla.; Chief William Fitzgerald, Seattle, Wash.; Police Chief Walter Headly, Jr., President, International Association of Chiefs of Police and H. G. Pope, Executive Director, Public Administration Service
3:45 p.m. **Planning for Major Disasters**—panel discussion with Chief Henry Thomas, Hartford, Conn., Moderator; Lloyd Layman, Director Fire Office, FCDA; John Russell, Deputy National Director, Disaster Services, American Red Cross and Chief Francis T. Scully, Waterbury, Conn.
8:00 p.m. Get-Together Party—Bay Front Auditorium

Tuesday, November 13

9:00 a.m. Registration (all day)—Dinner Key Auditorium
9:30 a.m. Address by Hon. A. Kelso Roberts, Attorney General Province of Ontario
12:00 noon Adjournment for lunch
2:00 p.m. **Developing Public Relations**—Harry Schlegel, New York Daily News
2:15 p.m. **A Fire Prevention Program that Is Bringing Results**—Chief Edward Connors, New York Fire Department
3:00 p.m. **New Hazards Facing the Fire Service**—Dr. Mathew M. Braidech, Director of Research, NBFU
3:30 p.m. **Should Paid Firemen Be Permitted Outside Employment**—panel discussion with Chief Reynold Malmquist, Minneapolis, Minn., Moderator; Chief Edward Blohm, Detroit, Mich.; Commissioner A. J. Mullaney, Chicago, Ill.; Chief Keith Klinger, Los Angeles County, Cal.
4:15 p.m. **Private Alarm Systems**—Arthur Sullivan, American District Telegraph Co.
7:30 p.m. Barbecue at Biscayne Key

Wednesday, November 14

9:00 a.m. Election of officers (Dinner Key Auditorium)
9:30 a.m. **The All-American Team**—Elmer Reske, Manager, Cook County Inspection Bureau
10:00 a.m. **What Fire Chiefs Should Know about Training**—W. Fred Heisler
10:30 a.m. **Volunteer Fire Department Problems** — panel discussion with Chief Donald Charles, Charlotte, N. C., moderator; and members of Volunteer Committee, IAFC
12:00 noon Adjournment for lunch
2:00 p.m. **Where Does the Fire Service Stand on Communications?**—panel discussion with Chief Roi B. Woolley, Editor, FIRE ENGINEERING, moderator; Grenfell Swim, Gamewell Company; Deputy Chief Thomas O'Brien, New York Fire Department and a representative of Southern Bell Telephone Co.
3:15 p.m. **A Pattern for Preparedness** — Chief George Hink, Philadelphia, Pa.
3:45 p.m. **The Use of Fog and Wet Water in Interior Fires**—panel discussion with Emmett Cox, Western Actuarial Bureau, Chicago, Ill., moderator; Chief Irving Merrick, Poughkeepsie, N. Y.; J. I. Fetters, University of Missouri; Robert Byrus, University of Maryland

Thursday, November 15

9:30 a.m. Business session including committee reports and installation of officers

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*38% Sales increase this year!
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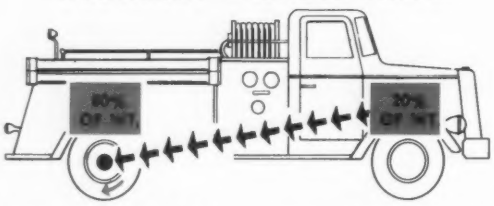
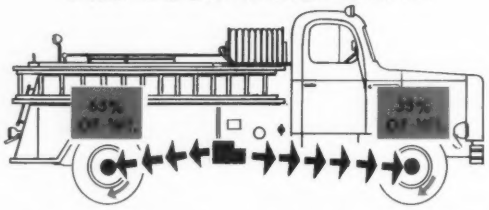
ORDINARY 2-WHEEL DRIVE



Spins easily because it is over-powered.

Drifts without power—may lock and be pushed into skids.

FWD FOUR WHEEL DRIVE



Less spin because power matches weight.

Power prevents locking and skidding—holds on turns, steers easily.

FWD balanced power and weight distribution gives unmatched high-speed safety

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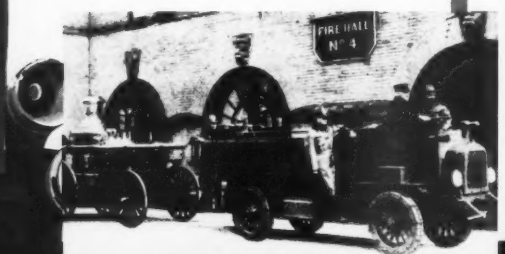
of America's finest
and safest
fire apparatus



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WHERE TO BUY

Directory of Equipment For Fire Departments

This special feature is provided for the guidance and convenience of fire officials and others concerned with the purchase of fire equipment. The companies listed comprise those whose products have recently been advertised in FIRE ENGINEERING and are thus now actively serving the fire protection field. For information on any type of equipment not listed, address Readers' Service Dept., FIRE ENGINEERING, 305 East 45th St., New York 17, N. Y.

ALARM SYSTEMS

Alerting

Federal Sign & Signal Corp.
Gamewell Company
General Electric Co.
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Automatic

American District Telegraph Co.
Falcon Alarm Co., Inc.
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Fyr-Larm Co., Inc.
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Pyrene—C-O-Two, Div. Fyr-Fyter Co.
Pyrotronics, Div., Baker Industries, Inc.

Batteries

Delco-Remy Div., G. M. C. (Automotive)
Gamewell Company
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Boxes

American District Telegraph Co.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Pioneer Electronic Instruments Co.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Cable

Gamewell Company
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Central Station

American District Telegraph Co.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Pyrene—C-O-Two Div., Fyr-Fyter Co., The

Home

Falcon Alarm Co., Inc.
Fyr-Fyter Co., The
Gamewell Company
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Standard Alarm & Signal Co.

Industrial

American District Telegraph Co.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Pioneer Electronic Instruments Co.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Standard Alarm & Signal Co.

Institutional

American District Telegraph Co.
Falcon Alarm Co., Inc.
Fyr-Larm Co., Inc.
Gamewell Company
General Electric Co.
Pioneer Electronic Instruments Co.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Municipal

Federal Sign & Signal Corp.
Fyr-Fyter Co., Inc.
Gamewell Company
Pioneer Electronic Instruments Co.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Radio

Bendix Radio Div., Bendix Aviation Corp.
Du Mont, Allen B., Laboratories, Inc.
General Electric Co.
Harron Labs.
Plectron Corp.

Recording Systems

American District Telegraph Co.
Gamewell Company
Pioneer Electronic Instruments Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Sirens, Air Horns, Whistles & Coders

Darley, W. S., & Co.
Fairwood Co., The
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fyr-Larm Co., Inc.
Gamewell Company
General Electric Co.
Pyle-National Co., The
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Sireno Co., Inc., The
Sterling Siren Fire Alarm Co., Inc.

Smoke

American District Telegraph Co.
Cardox Corp.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The

Tape Systems

Gamewell Company
General Electric Co.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The

APPARATUS WARNING DEVICES

Bells

American District Telegraph Co.
American LaFrance Corporation
Attwood Brass Works, Inc.
Darley, W. S., & Co.
Fire Master Corporation
H & H Fire Apparatus Corp. (Automatic)
Halprin Supply Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.

Lights

Arguslite Co.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Federal Sign & Signal Corp.
Fire Master Corporation
Fyr-Fyter Co., The
Halprin Supply Co.
McDermott Corp., Julian A.
Pyle-National Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Sireno Co., Inc., The
Trippe Manufacturing Company
U-C Lite Manufacturing Co.
Universal Fire Apparatus Corp.

Sirens

Darley, W. S., & Co.
Federal Sign & Signal Corp.
Fire Master Corporation
Fyr-Fyter Co., The
Halprin Supply Co.
Pyle-National Co., The
Sireno Co., Inc., The
Sterling Siren Fire Alarm Co., Inc.
Universal Fire Apparatus Corp.

Whistles

Falcon Alarm Co., Inc.
Gamewell Company
Reese, S. H.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Snyder, M. L., & Son, Inc.

AXES

Atlas Safety Equipment Co., Inc. (Insulated)
Buffalo Fire Appliance Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fire Master Corporation
Fyr-Fyter Co., Inc.
Halprin Supply Co.
Mann Edge Tool Cmpany
Universal Fire Apparatus Corp.

BADGES, INSIGNIA, ETC.

Blackinton, V. H., & Co., Inc.
Braxmar Co., Inc., The C. G.
Buffalo Fire Appliance Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Everson-Ross Co., Inc.
Fyr-Fyter Co., The
Gold Crest Safety Equipment Corp.
Halprin Supply Co.
Nielsen-Rionda, Inc.
Reese, S. H.
Russell Uniform Co.
Wentworth-Forman Co., Inc.
Wendell-Northwestern, Inc.

BATTERY CHARGERS

Carpenter Manufacturing Co.
Darley, W. S., & Co.

BLANKETS, FIRE

Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Fulton Bag & Cotton Mills
Industrial Safety Specialties Co.
Mine Safety Appliances Company
Safety Clothing & Equipment Co.
Sawyer, H. M., & Son, Div., Sawyer-Tower, Inc.
Snyder, M. L., & Son, Inc.

BRAKES, POWER, HYDRAULIC

Power Equipment Company

BROOMS, FIRE FIGHTING

Darley, W. S., & Co.

CLOTHING, PROTECTIVE

Asbestos

Darley, W. S., & Co.
Janesville Apparel Co.
(also aluminized asbestos)
Industrial Safety Specialties Co.
Mine Safety Appliances Company
Safety Clothing & Equipment Co.
Snyder, M. L., & Son, Inc.

Belts

Atlas Safety Equipment Co., Inc.
Buffalo Fire Appliance Corp.
Cairns & Bros., Inc.
Darley, W. S., & Co.
Mine Safety Appliances Company
Russell Uniform Co.
Safety Clothing & Equipment Co.
Service Belt Co., Inc.

(*Continued on next page*)

Boots
Buffalo Fire Appliance Corp.
Cairns & Bro., Inc.
Body Guard Mfg. Co.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fyr-Fyter Co., The
Goodrich Company, B. F.
Halprin Supply Co.
Industrial Safety Specialties Co. (Asbestos)
Janesville Apparel Co.
Mine Safety Appliances Company
Snyder, M. L., & Son, Inc.

Gloves
Cairns & Bro., Inc.
Darley, W. S., & Co.
Mine Safety Appliances Company
Safety Clothing & Equipment Co.
Snyder, M. L., & Son, Inc.

Helmets
Buffalo Fire Appliance Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Industrial Safety Specialties Co. (Asbestos)
Mine Safety Appliances Company
Safety Clothing & Equipment Co.
Snyder, M. L., & Son, Inc.

Innersoles
Cairns & Bro., Inc.
Darley, W. S., & Co.
Mine Safety Appliances Company

Rubber & Canvas Clothing
Body Guard Mfg. Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co. (canvas)
Fyr-Fyter Co., The
Globe Manufacturing Co. (canvas)
Goodrich Company, B. F.
Halprin Supply Co.
Janesville Apparel Co.
Midwestern Safety Mfg. Company
Mine Safety Appliances Company
Morning Pride Mfg. Co.
Russell Uniform Co.
Safety Clothing & Equipment Co.
Snyder, M. L., & Son, Inc.

Suits, Quick Hitch
Cairns & Bro., Inc.
Darley, W. S., & Co.
Globe Manufacturing Co.
Janesville Apparel Co.
Morning Pride Mfg. Co.
Russell Uniform Co.
Safety Clothing & Equipment Co.

CUTTERS, BAR, CHAIN, WIRE
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Newman Mfg. Co. (Hot Wire Cutters)
Porter, H. K., Inc.

CUTTING & WELDING EQUIPMENT
Darley, W. S., & Co.

EJECTORS AND EXHAUSTERS, SMOKE
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Homelite Corporation
Super Vacuum Mfg. Co., Inc.
Wooster Brass Div., The Fyr-Fyter Co.

ENGINES (Diesel or Gas)
Continental Motors
Detroit Diesel Engine Div., General Motors Corp.
General-Detroit Corp.
Hall-Scott, Inc.
Waukesha Motor Company

EXTINGUISHERS & SYSTEMS

CO2
American LaFrance Corp.
Buffalo Fire Appliance Corp.
Cardox Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fire Masters Corporation
Fyr-Fyter Co., The
Halprin Supply Co.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Snyder, M. L., & Son, Inc.
Red Comet, Inc.
Universal Fire Apparatus Corp.

Chimney Fire
Darley, W. S., & Co.
Foard, F. C., & Co.
Red Comet, Inc.

Dry Chemical
American LaFrance Corp.
Ansul Chemical Company
Buffalo Fire Appliance Corp.
Cardox Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Red Comet, Inc.
Safety First Products Corp.
Snyder, M. L., & Son, Inc.
Universal Fire Apparatus Corp.

Foam
American LaFrance Corp.
Buffalo Fire Appliance Corp.
Cardox Corp. (systems)
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
National Foam System, Inc.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Red Comet, Inc.
Snyder, M. L., & Son, Inc.
Universal Fire Apparatus Corp.

Pressurized Water
American LaFrance Corp.
Fyr-Fyter Co., The
Safety First Products Corp.

Soda & Acid
American LaFrance Corp.
Buffalo Fire Appliances Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
National Foam System, Inc.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Red Comet, Inc.
Snyder, M. L., & Son, Inc.
Universal Fire Apparatus Corp.

Vaporizing Liquid
American LaFrance Corp.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The (Loaded Stream)
Halprin Supply Co.
National Foam System, Inc.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Red Comet, Inc.
Snyder, M. L., & Son, Inc.
Universal Fire Apparatus Corp.

Water
American LaFrance Corp.
Buffalo Fire Appliance Corp.
Cardox Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Parco Products Co.
Protectoseal Company
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Red Comet, Inc.
Safety First Products Corp.
Smith, D. B., & Co.
Snyder, M. L., & Son
Universal Fire Apparatus Corp.
Unox Co., Div., McFarland Mfg. Corp.

FIRE ALARM & WATCHMAN'S REPORTING SERVICE
American District Telegraph Co.
Gamewell Company
Safa Alarm Div., Inc., Fyr-Fyter Co., The

FIRE DEPARTMENT SUPPLIES, MISC.
Akron Brass Mfg. Co., Inc.
American Fire Equipment Co.
American LaFrance Corp.
Attwood Brass Works
Bean, John, Div., Food Machinery & Chemical Corp.
Bomgardner Mfg. Co., The
Buffalo Fire Appliance Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fire Master Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Maxim Motor Co.
Oren Roanoke Corp.
Pacific Marine Supply Co.
Pacific Reflex Signs
Quaker Rubber Div., H. K. Porter Co., Inc.
Smith, D. B., & Co.
Snyder, M. L., & Son, Inc.
Universal Fire Apparatus Corp.
W-B Manufacturing Co.
Ward LaFrance Truck Corp.
Wooster Brass Div., The Fyr-Fyter Co.
Young Fire Equipment Corp.

FIRE DETECTION SYSTEMS (See Alarm Systems)
Fyr-Larm Co., Inc.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The

FIRE ESCAPES

Permanent
American Fire Equipment Co. (Rope)

FIRE ESCAPES

Portable
Atlas Safety Equipment Co., Inc.

FIRE RETARDANT MATERIALS

Paint, etc.
Fyr-Fyter Co., The
Safety Clothing & Equipment Co.

FIRST AID EQUIPMENT
Bomgardner Mfg. Co., The
Darley, W. S., & Co.
Emerson Co., J. H.
Fyr-Fyter Co., The
Halprin Supply Co.
Lincoln Laboratories, Inc.
Mine Safety Appliances Company
Stephenson Corporation

FOAM—CHEMICAL—LIQUID
American LaFrance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
National Foam Systems, Inc.
Nicerol, Ltd.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Company

FOAM GENERATORS OR PUMPS
American LaFrance Corp.
Cardox Corp.
Darley, W. S., & Co.
Hale Fire Pump Co.
National Foam System, Inc.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Company
Waterous Company

FORCIBLE ENTRY TOOLS
American LaFrance Corp.
Blackhawk Mfg Co.
C. D. Pike & Fire Hook Mfg. Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc
Fyr-Fyter Co., The
Halprin Supply Co.
Homelite Corporation
Key-Hak Div., Producers & Distributors, Inc.
Porter, H. K., Inc.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

GAS INDICATORS & DETECTORS
Mine Safety Appliances Company

GAUGES

Compound
Darley, W. S., & Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Piezometers
Akron Brass Mfg. Co.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Pressure
Darley, W. S., & Co.
Fyr-Fyter Co., The
Universal Fire Apparatus Corp.

Testing
Akron Brass Mfg. Co., Inc.
Darley, W. S., & Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

GENERATORS, AUTOMOTIVE

Alternators
Darley, W. S., & Co.
Delco-Remy Div., G. M. C. (A.C. & D.C.)
Electric Auto-Lite Co.
Leece-Neville Co., The

GOGGLES
Cairns & Bro., Inc.
Darley, W. S., & Co.
Mine Safety Appliances Company
Safety Clothing & Equipment Co.

HARDWARE FOR APPARATUS

Aluminum Ladder Company
Attwood Brass Works, Inc.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fire Master Corporation
Fyr-Fyter Co., The
H & H Fire Apparatus Corp.
Howe Fire Apparatus Co.
Universal Fire Apparatus Corp.

HOOK & PIKE POLES

Akron Brass Mfg. Co., Inc.
Aluminum Ladder Company
American LaFrance Corp.
Attwood Brass Works, Inc.
Buffalo Fire Appliance Corp.
C-D Pike & Fire Hook Mfg. Co.
Darley, W. S., & Co.
Duo-Safety Ladder Corp.
Fire Master Corporation
Fyr-Fyter Co., The
Pirsch, Peter, & Sons Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

HOSE

Chemical or Booster

American Rubber Mfg. Co., The
Bi-Lateral Fire Hose Co.
Boston Woven Hose & Rubber Co.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fire Master Corporation
Fyr-Fyter Co., The
Goodrich Company, B. F.
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins Incorporated
Oren Roanoke Corp.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corporation
Thermoid Company
Universal Fire Apparatus Corp.

Forestry

American Rubber Mfg. Co., The
Bi-Lateral Fire Hose Co.
Blaze Guard Mfg. Co.
Boston Woven Hose & Rubber Co.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eureka Firehose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodrich Company, B. F.
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corporation

High Pressure

American Rubber Mfg. Co., The
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Blaze Guard Mfg. Co.
Boston Woven Hose & Rubber Co.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fire Master Corporation
Fyr-Fyter Co., The
Goodrich Company, B. F.
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins Incorporated
Oren Roanoke Corp.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corporation
Thermoid Company
Universal Fire Apparatus Corp.

Rubber Lined

American LaFrance Corp.
American Rubber Mfg. Co., The
Bi-Lateral Fire Hose Co.
Blaze Guard Mfg. Co.
Boston Woven Hose & Rubber Co.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fire Master Corporation
Fyr-Fyter Co., The
Halprin Supply Co.
Goodrich Company, B. F.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins Incorporated
Oren Roanoke Corp.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corporation

Suction

American Rubber Mfg. Co., The
Bi-Lateral Fire Hose Co.
Boston Woven Hose & Rubber Co.
Buffalo Fire Apparatus Corp.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodrich Company, B. F.
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins Incorporated
Oren Roanoke Corp.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corporation
Thermoid Company
Universal Fire Apparatus Corp.

HOSE APPLIANCES

Holders

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Attwood Brass Works, Inc.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
H. & H. Fire Apparatus Corp.
Halprin Supply Co.
Wooster Brass Div., The Fyr-Fyter Co.

Hydrant Gates

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Mueller Co.
Powhatan Brass & Iron Works
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Increasers and Reducers

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
H & H Fire Apparatus Corp.
Halprin Supply Co.
Howe Fire Apparatus Co.
McIntire, F. N., Brass Works, Inc.
Powhatan Brass & Iron Works
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Siamese and Y-fittings

Akron Brass Mfg. Co., Inc.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Powhatan Brass & Iron Works
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Siphons

Akron Brass Mfg. Co., Inc.
Darley, W. S., & Co.
Wooster Brass Div., The Fyr-Fyter Co.

Suction Strainers

Fol-Da-Tank Co.

HOSE BRIDGES

Darley, W. S., & Co.
Fyr-Fyter Co., The
H & H Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

HOSE CABINET UNITS

Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Snyder, M. L., & Son, Inc.
Wooster Brass Div., The Fyr-Fyter Co.

HOSE CARTS AND RACKS

American Rubber Mfg. Co., The
Attwood Brass Works, Inc.
Bean, John, Div., Food Machinery & Chemical Corp. (Reels)
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
H & H Fire Apparatus Corp.
Halprin Supply Co.
Maxim Motor Co.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Snyder, M. L., & Son, Inc.
Wooster Brass Div., The Fyr-Fyter Co.

HOSE CLAMPS

Akron Brass Mfg Co., Inc.
American LaFrance Corp.
Attwood Brass Works, Inc.
Boston Woven Hose & Rubber Co.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Hewitt-Robins, Inc.
Pirsch, Peter, & Sons Co.
Powhatan Brass & Iron Works
Wooster Brass Div., The Fyr-Fyter Co.

HOSE CLEANER

Bi-Lateral Fire Hose Co.
Circul-Air Corp. (Washer)

HOSE COUPLING EXPANDERS

Akron Brass Mfg. Co., Inc.
Bell-Pihl Company
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Powhatan Brass & Iron Works
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

HOSE COUPLING EXPANSION RINGS

Akron Brass Mfg. Co., Inc.
Boston Woven Hose & Rubber Co.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
McIntire, F. N., Brass Works, Inc.
Halprin Supply Co.
Pacific Marine Supply Co.
Universal Fire Apparatus Corp.

HOSE COUPLINGS, ADAPTERS, WRENCHES

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Attwood Brass Works, Inc.
Bar-Way Manufacturing Co. (Couplings, High Pressure)
Boston Woven Hose & Rubber Co.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co., Inc.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins Incorporated
McIntire, F. N., Brass Works, Inc.
Powhatan Brass & Iron Works
Snyder, M. L., & Son, Inc.
Thermoid Company
Wooster Brass Div., The Fyr-Fyter Co.

HOSE DRYERS

Approved Fire Equipment Co., Inc.
Circul-Air Corporation
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.

HOSE JACKETS

Akron Brass Mfg. Co., Inc.
Boston Woven Hose & Rubber Co.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Goodrich Company, B. F., The
Republic Rubber Division, Lee Rubber & Tire Corporation
Wooster Brass Div., The Fyr-Fyter Co.

HOSE REELS

Ardmore Products
Buffalo Fire Appliance Corp.
Hannay, Clifford B., & Son, Inc.

HOSE STORAGE RACKS

Circul-Air Corporation
Elkhart Brass Mfg. Co., Inc.
W-B Manufacturing Co.

HOSE TURN TABLES

Circul-Air Corp.

(Continued on next page)

HYDRANT WRENCHES

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Powhatan Brass & Iron Works
S-T Hydrant Wrench Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

HYDRANTS

Mueller Co.
Universal Fire Apparatus Corp.
Waterous Company

JACKS (HYDRAULIC)

Blackhawk Mfg. Co.
Porter, H. K., Inc.

LADDERS

Aerial

American LaFrance Corp.
Duo-Safety Ladder Corp.
Maxim Motor Co.
Memco Aerial Ladder Co.
Pirsch, Peter, & Sons Co.

Metal

Aluminum Ladder Co.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Duo-Safety Ladder Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Universal Fire Apparatus Corp.
Ward LaFrance Truck Corp.

Rope

Atlas Safety Equipment Co., Inc.

Wood

American LaFrance Corp.
Buffalo Fire Apparatus Corp.
Darley, W. S., & Co.
Duo-Safety Ladder Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Maxim Motor Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Stephenson Corporation
Universal Fire Apparatus Corp.
Ward LaFrance Truck Corp.

LIFE BELTS

Atlas Safety Equipment Co., Inc.
Cairns & Bro., Inc.
Darley, W. S., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Memco Aerial Ladder Co.
Safety Clothing & Equipment Co.
Service Belt Co., Inc.
Stephenson Corporation
Wooster Brass Div., The Fyr-Fyter Co.

LIFE GUNS

Darley, W. S., & Co.
Naval Co.
Pacific Marine Supply Co.

LIGHTS

Emergency, Automatic

Carpenter Manufacturing Co.
U-C Lite Manufacturing Co.

Flares

Arguslite Co.
Darley, W. S., & Co.
McDermott Corp., Julian A.
U-C Lite Manufacturing Co.

Floodlights

Arguslite Co.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Homelite Corporation
McDermott Corp., Julian A.
Natale Machine & Tool Co.
Pyle-National Co., The
Sireno Co., Inc., The

Hand Lamps

Arguslite Co.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Dual-Lite Company
Fairbanks-Morse & Co.
Halprin Supply Co.
Koehler Manufacturing Co.
McDermott Corp., Julian A.
Mine Safety Appliances Company
Natale Machine & Tool Co.
Sireno Co., Inc., The
U-C Lite Manufacturing Co.
Universal Fire Apparatus Corp.

Searchlights

Arguslite Co.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
McDermott Corp., Julian A.
Natale Machine & Tool Co.
Sireno Co., Inc., The
Universal Fire Apparatus Corp.

LOUD SPEAKERS

Electronic Megaphones

Audio Equipment Co., Inc.
Darley, W. S., & Co.
University Loudspeakers Inc.

Public Address Systems

Audio Equipment Co., Inc.
Du Mont, Allen B., Laboratories, Inc.
Fyr-Fyter Co., The
General Electric Company
Motorola Inc.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
University Loudspeakers Inc.

MOTOR APPARATUS

Ambulances

Approved Fire Equipment Co., Inc.
Bomgardner Mfg. Co., The
Christopher Co., The
Gold Crest Safety Equipment Corp.
Miller Company, A. J.
National Body Mfg. Co.
Superior Coach Corp.
Ward LaFrance International Inc.

Chassis

Ford Motor Company
International Harvester Co.
Reo Motors Inc.

Crash Trucks

American LaFrance Corp.
Army's Fire Service
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery Chemical Corp.
Beck & Co., C. D.
Boardman Co., The
Brumbaugh Body Co.
Cardox Corp.
Christopher Co., The
Darley, W. S., & Co.
Decker Brothers
Fire Master Corp.
Four Wheel Drive Auto Co.
Gold Crest Safety Equipment Corp.
H & H Fire Apparatus Corp.
Howe Fire Apparatus Co.
International Harvester Company
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Pyrene—C-O-Two
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Ward LaFrance International, Inc.
Ward LaFrance Truck Corp.
Young Fire Equipment Corp.

Ladder Trucks, Aerial

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Darley, W. S., & Co.
Four Wheel Drive Auto Co.
Howe Fire Apparatus Co.
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Sharpsville Steel Fabricators, Inc. (Junior)
Seagrave Corporation
Universal Fire Apparatus Corp.
Ward LaFrance International, Inc.
Ward LaFrance Truck Corp.

Ladder Trucks, Service

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Christopher Co., The
Darley, W. S., & Co.
Four Wheel Drive Auto Co.
H. & H. Fire Apparatus Corp.
Howe Fire Apparatus Co.
International Harvester Co.
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Ward LaFrance International, Inc.
Ward LaFrance Truck Corp.

Pumpers and Hose Cars

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Army's Fire Service
Bean, John, Div., Food Machinery & Chemical Corp.
Beck & Co., Inc., C. D.
Boardman Co., The
Brumbaugh Body Co.
Christopher Co., The
Darley, W. S., & Co.
Decker Brothers
Fire Fighter Truck Co.
Fire Master Corporation
Four Wheel Drive Auto Co.
Gold Crest Safety Equipment Corp.
H & H Fire Apparatus Corp.
Howe Fire Apparatus Co.
International Harvester Co.
Mack Trucks, Inc.
Maxim Motor Co.
National Foam System, Inc.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Ward LaFrance International, Inc.
Ward LaFrance Truck Corp.
Young Fire Equipment Corp.

Pumpers, High Pressure Fog

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Army's Fire Service
Bean, John, Div., Food Machinery & Chemical Corp.
Beck & Co., Inc., C. D.
Boardman Co., The
Christopher Co., The
Darley, W. S., & Co.
Fire Fighter Truck Co.
Fire Master Corporation
Four Wheel Drive Auto Co.
H & H Fire Apparatus Corp.
Howe Fire Apparatus Co.
International Harvester Company
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Seagrave Corporation, The
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Ward LaFrance Truck Corp.
Ward LaFrance International, Inc.
Young Fire Equipment Corp.

Rescue and Squad Trucks

American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The
Brumbaugh Body Co.
Christopher Co., The
Darley, W. S., & Co.
Decker Brothers
Four Wheel Drive Auto Co.
Gold Crest Safety Equipment Corp.
H & H Fire Apparatus Corp.
Howe Fire Apparatus Co.
International Harvester Company
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Reading Body Co.
Seagrave Corporation, The
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Ward LaFrance International, Inc.
Ward LaFrance Truck Corp.
Young Fire Equipment Corp.

Tank Trucks

American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Boardman Co., The
Christopher Co., The
Darley, W. S., & Co.
Decker Bros.
Fire Fighter Truck Co.
Fire Master Corporation
Four Wheel Drive Auto Co.
Gold Crest Safety Equipment Corp.
H & H Fire Apparatus Corp.
Howe Fire Apparatus Co.
International Harvester Company
Mack Trucks, Inc.
Maxim Motor Co.

National Foam System, Inc.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Ward LaFrance International, Inc.
Ward LaFrance Truck Corp.
Young Fire Equipment Corp.

Utility and Repair Trucks

Boardman Co., The
Christopher Co., The
Darley, W. S., & Co.
Four Wheel Drive Auto Co.
H & H Fire Apparatus Corp.
International Harvester Company
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Ward LaFrance Truck Corporation
Young Fire Equipment Corp.

NETS, LIFE AND TRAINING

Atlas Safety Equipment Company, Inc.
Darley, W. S., & Co.

NOVELTIES and MISCELLANEOUS

Hobby Mats (Coasters)

NOZZLES

Cellar Pipe

Akron Brass Mfg. Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Rockwood Sprinkler Company
Wooster Brass Div., The Fyr-Fyter Co.

Deck Guns

Akron Brass Mfg. Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Buffalo Fire Appliance Corp.
Chiksan Co.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Rockwood Sprinkler Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Deluge Sets

Akron Brass Mfg. Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Buffalo Fire Appliance Corp.
Chiksan Co.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Rockwood Springler Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Distributor

Akron Brass Mfg. Co., Inc.
Ansul Chemical Company
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
McIntire, F. N., Brass Works, Inc.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Foam

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cardox Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Halprin Supply Co.
National Foam System, Inc.
Nicerol, Ltd.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Company
Unox Co., Div., McFarland Mfg. Corp.

Fog

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
American Rubber Mfg. Co., The
Attwood Brass Works, Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Buffalo Fire Appliance Corp.
Cardox Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fog Nozzle International, Div. of Akron Brass
Fyr-Fyter Co., The
Halprin Supply Co.
Hardie Mfg. Co.
Myers, F. E., & Bro. Co.
McIntire, F. N., Brass Works, Inc.
National Foam System, Inc.
Powhatan Brass & Iron Works
Rockwood Sprinkler Company
Universal Fire Apparatus Corp.
Unox Co., Div., McFarland Mfg. Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Fog-Foam

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cardox Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co.
Fyr-Fyter Co., The
National Foam System, Inc.
Rockwood Sprinkler Company
Wooster Brass Div., The Fyr-Fyter Co.

Fog, High Pressure

Bean, John, Div., Food Machinery & Chemical Corp.
Cardox Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Hardie Mfg. Co.
McIntire, F. N., Brass Works, Inc.
Myers, F. E., & Bro. Co.
Rockwood Sprinkler Co.
Universal Fire Apparatus Corp.

Master Stream

Akron Brass Mfg. Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Chiksan Co.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
McIntire, F. N., Brass Works, Inc.
Universal Fire Apparatus Corp.

Partition

Akron Brass Mfg. Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Javelin Tool & Supply Co.
Wooster Brass Div., The Fyr-Fyter Co.

Pipes, Ladder

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
McIntire, F. N., Brass Works, Inc.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Pipes, Play

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Woven Hose & Rubber Co.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
National Foam System, Inc.
Powhatan Brass & Iron Works
Pyrene—C-O-Two
Rockwood Sprinkler Company
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

Shut-Off

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
American Rubber Mfg. Co., The
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Powhatan Brass & Iron Works
Rockwood Sprinkler Company
Smith, D. B., & Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., The Fyr-Fyter Co.

OUTBOARD MOTORS

Johnson Motors
Pacific Marine Supply Co.

POLYESTER FIBRE FOR FIRE HOSE

Dupont de Nemours, E. I., Co. (Inc.), Tex. Tile Fibres Dept.

POWER PLANTS & LIGHTING PLANTS ELECTRIC

Portable

Cairns & Bro., Inc.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Detroit Diesel Engine Div., General Motors Corp.
Fairbanks-Morse & Co.
Fyr-Fyter Co., The
Homelite Corporation
Kohler Co.
Onan, D. W., & Sons, Inc.
Pioneer Gen-E-Motor Corp.
Ward LaFrance International, Inc.
Ward LaFrance Truck Corp.
Winpower Mfg. Co.

Stationary

Detroit Diesel Engine Div., General Motors Corp.
Katolight Corp.
Kohler Co.
Onan, D. W., & Sons, Inc.
Pioneer Gen-E-Motor Corp.
Ward LaFrance International, Inc.
Ward LaFrance Truck Corp.
Winpower Mfg. Co.

POWER STEERING, HYDRAULIC

Garrison Mfg. Company, Inc.

POWER TOOLS

Blackhawk Mfg. Co.
Key-Hak Div., Producers & Distributors, Inc.
Pioneer Gen-E-Motor Corp.
Porter, H. K., Inc.

POWER UNITS, FIRE BOAT

Detroit Diesel Engine Div., General Motors Corp.

PROPORTIONERS (WET WATER)

American LaFrance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Hale Fire Pump Co. (Foam)
National Foam System, Inc.
Pyrene Manufacturing Company
Rockwood Sprinkler Company
Unox Co., Div., McFarland Mfg. Corp.

PROTECTIVE BREATHING & REVIVING APPARATUS

Air Breathing Equipment

Acme Protection Equipment Co.
Bomgardner Mfg. Co., The
Cornelius Co., The (Air Compressors)
Darley, W. S., & Co.
Globe Industries, Inc., Medical & Hospital Div.
Halprin Supply Co.
Mine Safety Appliances Company
Safety Clothing & Equipment Co.
Scott Aviation Corp.
Stephenson Corporation

Aspirators

Bomgardner Mfg. Co., The
Darley, W. S., & Co.
E & J Manufacturing Company
Emerson Co., J. H.
Globe Industries, Inc., Medical & Hospital Div.
Midwest Oxygen Equipment Co.
Mine Safety Appliances Company
Safety Clothing & Equipment Co.
Stephenson Corporation

Inhalators

Bomgardner Mfg. Co., The
Cycle-Flo Company
Darley, W. S., & Co.
E & J Manufacturing Company
Emerson Co., J. H.
Fyr-Fyter Co., The
Globe Industries, Inc., Medical & Hospital Div.
Midwest Oxygen Equipment Co.
Mine Safety Appliances Company
Scott Aviation Corp.
Stephenson Corporation

Masks

Acme Protection Equipment Co.
Cairns & Bro., Inc.
Cycle-Flo Company
Darley, W. S., & Co.

(*Continued on next page*)

Masks (Continued)

Fyr-Fyter Co., The
Globe Industries, Inc., Medical & Hospital Div.
Mine Safety Appliances Company
Safety Clothing & Equipment Co.
Scott Aviation Corp.

Oxygen Breathing Equipment

Bomgardner Mfg. Co., The
Cycle-Flo Company
Darley, W. S., & Co.
Fyr-Fyter Co., The
Globe Industries, Inc., Medical & Hospital Div.
Halprin Supply Co.
Mine Safety Appliances Company
Scott Aviation Corp.
Stephenson Corporation

Respirators

Bomgardner Mfg. Co., The
Darley, W. S., & Co.
Mine Safety Appliances Company
Scott Aviation Corp.
Stephenson Corporation

Resuscitators

Batrow Laboratories, Inc.
Bomgardner Mfg. Co., The
Darley, W. S., & Co.
E & J Manufacturing Company
Emerson Co., J. H.
Globe Industries, Inc., Medical & Hospital Div.
Halprin Supply Co.
Midwest Oxygen Equipment Co.
Mine Safety Appliances Company
Stephenson Corporation

PUMPS

Fire Apparatus

American Fire Equipment Co.
American LaFrance Corp.
American-Marsh Pumps, Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fire Master Corporation
Four Wheel Drive Auto Co.
Gorman-Rupp Co.
Hale Fire Pump Co.
Hardie Mfg. Co.
Howe Fire Apparatus Co.
Oberdorfer Foundries, Inc.
Pacific Marine Supply Co.
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Ward LaFrance Truck Corp.
Waterous Company

Hand Pumps

Darley, W. S., & Co.
Oberdorfer Foundries, Inc.
Parco Products Co.
Smith, D. B., & Co.

High Pressure

American LaFrance Corp.
American-Marsh Pumps, Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Gorman-Rupp Co.
Hale Fire Pump Company
Hardie Mfg. Co.
High Fog Pump Co.
Marine Products Company
Myers, F. E., & Bro. Co.
Pacific Marine Supply Co.
Sharpsville Steel Fabricators, Inc.
Ward LaFrance Truck Co.
Waterous Company

Hydrant Dewatering

Akron Brass Mfg. Co., Inc.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Gorman-Rupp Co.
Marine Products Company
Oberdorfer Foundries, Inc.
Waterous Company
Wooster Brass Div., The Fyr-Fyter Co.

Portable

American-Marsh Pumps, Inc.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Gorman-Rupp Co.
Hale Fire Pump Co.
Halprin Supply Co.
Homelite Corporation
Marine Products Company
Marlow Pumps
Oberdorfer Foundries, Inc.
Pacific Marine Supply Co.
Parco Products Co. (Knapsack)
Smith, D. B., & Co.
Universal Fire Apparatus Corp.
Ward LaFrance International Corp.
Ward LaFrance Truck Corp.

Suction Boosters

American-Marsh Pumps, Inc.
Darley, W. S., & Co.
Gorman-Rupp Co.
Marine Products Co.
Marlow Pumps
Oberdorfer Foundries, Inc.

Trailer Mounted

American Fire Equipment Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Hale Fire Pump Co.
Maxim Motor Co.
National Foam System, Inc.
Oberdorfer Foundries, Inc.
Universal Fire Apparatus Corp.
Ward LaFrance Truck Corp.
Waterous Company

RADAR EQUIPMENT

Decca Radar, Inc.

RADIATION METERS

Curtiss-Wright Corp.

RADIO

Mobile and Station

Bendix Radio Div., Bendix Aviation Corp.
Du Mont, Allen B., Laboratories, Inc.
General Electric Co.
Monitoradio Div., I. D. E. A., Inc.
Motorola, Inc.

Portable

Bendix Radio Div., Bendix Aviation Corp.
General Electric Co.

Receivers

Bendix Radio Div., Bendix Aviation Corp.
Du Mont, Allen B., Laboratories, Inc.
General Electric Company
Harron Labs.
Motorola, Inc.
Monitoradio Div., I. D. E. A., Inc.
Plectron Corp.

RECORDERS

American District Telegraph Co.
Gamewell Company
Safa Alarm Div., Inc., Fyr-Fyter Co., The

RUST PREVENTATIVES

Dakota Chemical Co.

SAFETY EQUIPMENT FOR FLAMMABLE LIQUIDS

American LaFrance Corp.
Darley, W. S., & Co.
Falcon Alarm Co., Inc.
Fyr-Fyter Co., The
Koehler Mfg. Co.
Mine Safety Appliances Company
National Foam System, Inc.
Protectoseal Co.

SALVAGE COVERS

Amerotron Corp.
Buffalo Fire Appliance Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fulton Bag & Cotton Mills
Fyr-Fyter Co., The
Hoosier Tarpaulin & Canvas Goods Co., Inc.
Safety Clothing & Equipment Co.
Sawyer, H. M., & Son, Inc., Div. Sawyer-Tower, Inc.
Snyder, M. L., & Son, Inc.

SAWS, CHAIN

Homelite Corporation

SEAT BELTS

Rupert Parachute Co.
Safety Clothing & Equipment Co.
Service Belt Co., Inc.

SIGNS & EMBLEMS, APPARATUS

Attwood Brass Works, Inc.
Bomgardner Mfg. Co., The
Darley, W. S., & Co.
H & H Fire Apparatus Corp.
Lane, E. B., Distributor (Plastic Signs)
Maxim Motor Co.
Nielsen-Rionda, Inc.
Pacific Reflex Signs
Wentworth-Forman Co., Inc.
Wooster Brass Div., The Fyr-Fyter Co.

SLIDING POLES, FIRE STATION

McIntire, F. N., Brass Works, Inc.

SMOKE & ODOR REMOVERS (Chemical)

Foard, F. C., & Co.
Fyr-Fyter Co., The
Super Vacuum Mfg. Co., Inc.

SMOKE BOMBS

Superior Signal Co., Inc.

SMOKE DETECTORS

American District Telegraph Co.
Cardox Corp.
Pyrene—C-O-Two Div., Fyr-Fyter Co., The

SPLINTS

Mine Safety Appliances Company
Stephenson Corporation

SPRINKLER SUPERVISORY SERVICE

American District Telegraph Co.
Gamewell Company
Grinnell Company, The

SPRINKLERS & SYSTEMS

Akron Brass Mfg. Co., Inc.
Grinnell Company, Inc.
National Foam System, Inc.
Rockwood Sprinkler Company

STRAINERS, MAIN & SUCTION

Akron Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Wooster Brass Div., The Fyr-Fyter Co.

STRETCHERS—AMBULANCE COTS

Bomgardner Mfg. Co., The
Darley, W. S., & Co.
Medical Supply Co.
Safety Clothing & Equipment Co.
Stephenson Corporation
Washington Products Co., Div. Washington Mortuary Supply Co.

TELEPHONE—EMERGENCY

Gamewell Company
Mine Safety Appliances Company
Pioneer Electronic Instruments Corp.

THAWING EQUIPMENT, HYDRANT

Darley, W. S., & Co.
Smith, D. B., & Co.
Universal Fire Apparatus Corp.

THREAD CUTTING EQUIPMENT

Akron Brass Mfg. Co., Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Wooster Brass Div., The Fyr-Fyter Co.

TRAFFIC CONTROL EQUIPMENT

Atlas Safety Equipment Co., Inc.
Darley, W. S., & Co.
Eagle Signal Corp., Municipal Div.
Electronic Protection, Inc., sub. Standard Coil Products Co., Inc.
General Electric Co.

TRAINING AIDS

A. & W. Specialty Co.
Brady, Robert J., Co.
Fire-Fighting Films

TROPHIES & PLAQUES

City Plaque Shop
National Trophy Sales, Inc.

VALVES

Hose

Universal Fire Apparatus Co.
Akron Brass Mfg. Co., Inc.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Hale Fire Pump Co.
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Powhatan Brass & Iron Works
Rockwood Sprinkler Company
Waterous Company
Wooster Brass Div., The Fyr-Fyter Co.

Hydrant—Gate

Akron Brass Mfg. Co., Inc.
Buffalo Fire Appliance Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.

Excelsior Brass Mfg. Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Keystone Valve Corp.
McIntire, F. N., Brass Works, Inc.
Mueller Co.
Powhatan Brass & Iron Works
Waterous Company
Wooster Brass Div., The Fyr-Fyter Co.

Relief

Akron Brass Mfg. Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Hale Fire Pump Co.
Pacific Marine Supply Co.
Universal Fire Apparatus Corp.
Waterous Company
Wooster Brass Div., The Fyr-Fyter Co.

WATER TANKS, PORTABLE CANVAS

Darley, W. S., & Co.
Fol-Da-Tank Co.
Harodikes, Incorporated
Pacific Marine Supply Co.

WEARING APPAREL

Hats and Caps—Uniform

Brunssen Co., Inc., George
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Mines Safety Appliances Company
Reese, S. H.
Russell Uniform Co.
Safety Clothing & Equipment Co.
Snyder, M. L., & Son, Inc.
Wentworth-Forman Co., Inc.

Shirts, Uniform

Cairns & Bro., Inc.
Darley, W. S., & Co.
Russell Uniform Co.

Uniforms

Darley, W. S., & Co.
Russell Uniform Co.

Woolen Socks and Mitts

Cairns & Bro., Inc. (Gloves & Mittens)
Morning Pride Mfg. Co. (Mitts)

WETTING AGENTS

American LaFrance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
National Foam System, Inc.
Rockwood Sprinkler Company
Unox Co. Div., McFarland Mfg. Corp.

DIRECTORY OF MANUFACTURERS

Listed in WHERE TO BUY SECTION

For Advertisers in this issue see Advertising Index on page 1034

A & W Specialty Co., 3717 Midland Ave., Syracuse 7, N. Y.
Acme Protection Equipment Co., 215 Kalamazoo St., South Haven, Mich.
Akron Brass Mfg. Co., Inc., 1500 Spruce St., Wooster, Ohio
Aluminum Ladder Co., Worthington, Pa.
American District Telegraph Co., 155 Sixth Ave., New York 13, N. Y.
American Fire Apparatus Co., Main Street Rd., Battle Creek, Mich.
American Fire Equipment Co., 715 Boylston St., Boston 16, Mass.
American LaFrance Corp., 100 E. LaFrance St., Elmira, N. Y.
American-Marsh Pumps, Inc., Capital Ave., Battle Creek, Mich.
American Rubber Mfg. Co., 1145 Park Ave., Oakland 8, Cal.
Amerotron Corp., 1407 Broadway, New York 18, N. Y.
Ansul Chemical Co., 1 Stanton St., Marinette, Wis.
Approved Fire Equipment Co., Inc., Austin & Audubon Blvd., Island Park, L. I., N. Y.
Ardmore Products, 1825 Sherman Rd., Northbrook, Ill.
Argulite Co., Blue Ridge Summit, Pa.
Army's Fire Service, Old Forge, N. Y.
Atlas Safety Equipment Co., Inc., 27 Warren St., New York 7, N. Y.
Attwood Brass Works, 303 Douglas Ave., Grand Rapids, Mich.
Audio Equipment Co., Inc., 805 Middleneck Rd., Great Neck, L. I., N. Y.

Bar-Way Mfg. Co., 60 Canal St., Stamford, Conn.
Batrow Laboratories, Inc., Branford, Conn.
Bean, John, Div., Food Machinery and Chemical Corp., P. O. Box 840, 1305 S. Cedar St., Lansing 4, Mich.
Beck, C. D., & Co., Sidney, Ohio
Bell-Pihl Co., 17 Wyman St., Arlington 74, Mass.
Bendix Radio Div., Bendix Aviation Corp., Baltimore 4, Md.
Bi-Lateral Fire Hose Co., 20 N. Wacker Dr., Chicago, Ill.
Blackhawk Mfg. Co., 5325 W. Rogers St., Milwaukee 46, Wis.
Blackinton, V. H., & Co., Inc., Attleboro Falls, Mass.
Blaze Guard Mfg. Co., North Bergen, N. J.
Boardman Co., P. O. Box 1152, 1401 S. W. 11th St., Oklahoma City, Okla.
Body-Guard Mfg. Co., 222 S. Fourth St., St. Joseph, Mo.
Bomgardner Mfg. Co., The, 1384 Hird Ave., Cleveland 7, Ohio
Boston Woven Hose & Rubber Co., 29 Hampshire St., Cambridge, Mass.
Brady, Robert J., Co., 3255 M St., N. W., Washington 7, D. C.
Braxmar Co., C. C., Inc., 216 E. 45th St., New York 17, N. Y.
Brunssen Company, George, Inc., 104-106 Bleecker St., New York 12, N. Y.
Buffalo Fire Appliance Corp., 221 Crane St., Dayton 1, Ohio

Cairns & Bro., Inc., 854 Bloomfield Ave., Allwood, Clifton, N. J.
Cardox Corp., 307 N. Michigan Ave., Chicago, Ill.
Carpenter Mfg. Co., Master Light Building, Somerville 45, Mass.
C. D. Pike & Fire Hook Mfg. Corp., 207 Orange St., New Haven 10, Conn.
Chiksan Co., P. O. Box 158, Brea, Cal.
Christopher Co., The, 66-70 Beaver St., New York 4, N. Y.
Circul Air Corp., 575 E. Milwaukee Ave., Detroit 2, Mich.
City Plaque Shop, Box 6, Eastwood Station, Syracuse 6, N. Y.
Continental Motors, 205 Market St., Muskegon, Mich.
Cornelius Company, The, 550—39th Ave., N. E., Minneapolis 21, Minn.
Curtiss-Wright Corp., Carlstadt, N. J.
Cycle-Flo Co., 585 Bridgeport Ave., Milford, Conn.

Dakota Chemical Co., 213 W. Tenth St., Sioux Falls, S. Dak.
Darley, W. S., & Co., 2810 Washington Blvd., Chicago 12, Ill.
Decca Radar, Inc., 539 W. 25th St., New York, N. Y.
Decker Bros., 300 Lincoln Ave., Hawthorne, N. Y.
Delco-Remy Div., General Motors Corp., Anderson, Ind.
Detroit Diesel Engine Div., General Motors Corp., 13400 W. Outer Dr., Detroit 28, Mich.
Du Mont, Allen B., Laboratories, Inc., 760 Bloomfield Ave., Clifton, N. J.
Duo-Safety Ladder Corp., 811 9th St., Oshkosh 1, Wis.
Du Pont de Nemours, E. I., & Co., Inc., Textile Fibers Dept., Wilmington 98, Del.

E & J Mfg. Co., 100 E. Graham Place, Burbank, Cal.
Eagle Signal Corp., Municipal Div., 202 - 20th St., Moline, Ill.
Eastman, Samuel, & Co., Inc., Carpenter St., Concord, N. H.
Electric Auto-Lite Co., Toledo, Ohio
Electronic Protection, Inc., sub., Standard Coil Products Co., Inc., 2085 N. Hawthorne Ave., Melrose Park, Ill.
Elkhart Brass Mfg. Co., Inc., 1302 W. Beardsley Ave., Elkhart, Ind.
Emerson, J. H., Co., 22 Cottage Park Ave., Cambridge 40, Mass.
Eureka Fire Hose Div., U. S. Rubber Co., 1 Market St., Passaic, N. J.
Everson-Ross Co., Inc., 88 Chambers St., New York 7, N. Y.
Excelsior Brass Mfg. Co., 3452 N. Knox Ave., Chicago 41, Ill.

Fabric Fire Hose Co., Sandy Hook, Conn.
Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
Fairwood Co., The, Hanover Center, Mass.
Faloon Alarm Co., Inc., 243 Broad St., Summit, N. J.
Federal Sign & Signal Corp., 8702 S. State St., Chicago 19, Ill.
Fire Fighter Truck Co., 3148 Fifth Ave., Rock Island, Ill.
Fire-Fighting Films, 304A Green St., San Francisco 11, Cal.
Fire Master Corp., 36100 Harper St., Mt. Clemens, Mich.
Foard, F. C., & Co., P. O. Box 481, Bridgeport, Conn.
Fol-Da-Tank Co., Box 361, Rock Island, Ill.
Ford Motor Co., P. O. Box 658, Dearborn, Mich.
Four Wheel Drive Auto Co., Clintonville, Wis.
Fulton Bag & Cotton Mills, 10 Boulevard S. E., Atlanta, Ga.
Fyr-Fyter Co., The, 221 Crane St., Dayton 1, Ohio

Gamewell Co., 1238 Chestnut St., Newton Upper Falls 64, Mass.
Garrison Mfg. Co., Inc., 4609 E. Shiela St., Los Angeles 22, Cal.
General Detroit Corp., 2272 E. Jefferson Ave., Detroit, Mich.
General Electric Co., Atlantic Bldg., Syracuse, N. Y.
Globe Industries, Inc., Medical & Hospital Div., 125 Sunrise Pl., Dayton 7, Ohio
Globe Manufacturing Co., Pittsfield, N. H.
Gold Crest Safety Equipment Corp., P. O. Box 153, Highway 22, Dunellen, N. J.
Goodrich, B. F., Company (Industrial Products Div.), 500 S. Main St., Akron 18, Ohio
Gorman-Rupp Co., 305 S. Bowman St., Mansfield, Ohio
Grinnell Co., Inc., 260 W. Exchange St., Providence 1, R. I.

(*Continued on next page*)

MANUFACTURERS—*Continued*

H & H Fire Apparatus Corp., 725 Tonnele Ave., Jersey City 7, N. J.
Hale Fire Pump Co., Conshohocken, Pa.
Hall-Scott, Inc., 2850 - 7th Ave., Berkeley, Cal.
Halprin Supply Co., 1355 S. Flower St., Los Angeles 15, Cal.
Hamilton Rubber Mfg. Corp., Meade St., Trenton 3, N. J.
Hannay, Clifford B., & Son, Inc., Westerlo, N. Y.
Hardie Mfg. Co., Hudson, Mich.
Harodikes, Inc., North Dighton, Mass.
Harron Labs., 42-10 220th St., Bayside 61, N. Y.
Hewitt-Robins, Inc., 666 Glenbrook Rd., Stamford, Conn.
High Fog Pump Co., 56 N. Hill Ave., Pasadena, Cal.
Hobby Matt, Dept. F, Box 145, Balsam Lake, Wis.
Homelite Corp., 308 Riverdale Ave., Port Chester, N. Y.
Hoosier Tarpaulin & Canvas Goods Co., Inc., 1302-10 W. Washington St., Indianapolis 6, Ind.
Howe Fire Apparatus Co., Anderson, Ind.

Industrial Radio Corp., 42 N. Parkside Ave., Chicago 44, Ill.
Industrial Safety Specialties Co., Eighth and Chestnut Sts., Perkasie, Pa.
International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Janesville Apparel Co., 246 N. Franklin St., Janesville, Wis.
Javelin Tool & Supply Co., Erie, Pa.
Johnson Motors, 6200 Pershing Rd., Waukegan, Ill.

Katolight Corp., Mankato, Minn.
Key-Hak Div., Producers & Distributors, Inc., 1321 Hanover Ave., Allentown, Pa.
Keystone Valve Corp., 5325 Kirby Dr., P. O. Box 6716, Houston 5, Texas
Koehler Mfg. Co., 395 Lincoln St., Marlboro, Mass.
Kohler Co., Kohler, Wis.

Lane, E. B., 32 Greenwood Ave., Toledo 5, Ohio
Leece-Neville Co., 1374 E. 51st St., Cleveland 3, Ohio
Lincoln Laboratories, Inc., P. O. Box 1139, Decatur, Ill.

McDermott, Julian A., Corp., 4022 National St., Corona, N. Y.
McIntire, F. N., Brass Works, Inc., 377 Putnam Ave., Cambridge 39, Mass.
Mack Trucks, Inc., 1353 W. Front St., Plainfield, N. J.
Mann Edge Tool Co., Lewistown, Pa.
Marine Products Co., 515 Lycaste, Detroit 14, Mich.
Marlow Pumps, Box 200, Midland Park, N. J.
Maxim Motor Co., Middleboro, Mass.
Medical Supply Co., Rockford, Ill.
Memco Aerial Ladder Co., 1007 N. W. 36th St., Oklahoma City 18, Okla.
Midwest Oxygen Equipment Co., 1664 W. Ogden Ave., Chicago 12, Ill.
Midwestern Safety Mfg. Co., Mackinaw, Ill.
Miller, A. J., Company, Bellefontaine, Ohio
Mine Safety Appliances Co., 201 North Braddock Ave., Pittsburgh 8, Pa.
Monitoradio Div., I. D. E. A., Inc., 7900 Pendleton Pike, Indianapolis 26, Ind.
Morning Pride Co., 1986 Home Ave., Dayton 3, Ohio
Motorola, Communications & Electronics, Inc., 4501 West Augusta Blvd., Chicago 51, Ill.
Mueller Co., 512 West Cerro Gordo St., Decatur, Ill.
Myers, F. E., & Bro., Co., Orange St., Ashland, Ohio

Natale Machine and Tool Co., 339 State Highway No. 17, Carlstadt, N. J.
National Body Mfg. Co., Knightstown, Ind.
National Foam System, Inc., Union and Adams Sts., West Chester, Pa.
Naval Co., Old Easton Highway, Doylestown, Pa.
National Trophy Sales, Inc., 75 W. Van Buren St., Chicago 4, Ill.
Newman Mfg. Co., 3636 Main St., Kansas City 11, Mo.
Nicerol Limited, Geo. T. Reynolds, U. S. Repr., P. O. Box 395, Thornwood, N. Y.
Nielsen-Rionda, Inc., 40 John St., New York 38, N. Y.

Oberdorfer Foundries, Inc., Syracuse 1, N. Y.
Onan, D. W., & Sons, Inc., 3032 University Ave., S. E., Minneapolis 14, Minn.
Oren Roanoke Corp., P. O. Box 264, Roanoke 2, Va.

Pacific Marine Supply Co., 1223 Western Ave., Seattle 1, Wash.
Pacific Reflex Signs, Box 323, McMinnville, Ore.
Parco Products Co., Pennsburgh, Pa.
Pioneer Electronic Instruments Co., 11300 Hindry Ave., Los Angeles 45, Cal.
Pioneer Gen-E-Motor Corp., 5841 W. Dickens Ave., Chicago 39, Ill.
Pirsch, Peter, & Sons Co., 1308 35th St., Kenosha, Wis.
Plectron Corp., P. O. Box 7, Overton, Neb.
Portable Light Co., Inc., 216 William St., New York 38, N. Y.
Porter, H. K., Inc., 74 Foley St., Somerville 43, Mass.
Power Equipment Co., 6000 Paseo St., Kansas City, Mo.
Powhatan Brass & Iron Works, Ranson, W. Va.
Protectoseal Co., 1920 S. Western Ave., Chicago 8, Ill.
Pyle-National Co., The, 1334 N. Koster Ave., Chicago 51, Ill.
Pyrene—C-O-Two, Div., Fyr-Fyter Co., The, U. S. Highway 1, Newark 1, N. J.
Pyrotronics, Div., Baker Industries, Inc., P. O. Box 390, Newark, N. J.

Quaker Rubber Div., H. K. Porter Co., Inc., Comly and Tacony Sts., Philadelphia 24, Pa.

Reading Body Co., Reading, Pa.
Red Comet, Inc., Red Comet Bldg., Littleton, Colo.
Reese, S. H., 57 Warren St., New York 7, N. Y.
Reo Motors Inc., Lansing, Mich.
Republic Rubber Div., Lee Rubber & Tire Corp., Albert St., Youngstown 1, Ohio
Rockwood Sprinkler Co., 38 Harlow St., Worcester 5, Mass.
Rupert Parachute Co., Palatine Rd., Wheeling, Ill.
Russell Uniform Co., 192 Lexington Ave., New York 16, N. Y.

Safa Alarm Div., Inc., Fyr-Fyter Co., The, 243 West Market St., Orrville, Ohio
Safety Clothing & Equipment Co., 1990 E. 69th St., Cleveland 3, Ohio
Safety First Products Corp., 175 Saw Mill River Rd., Elmsford, N. Y.
Sawyer, H. M., & Son, Div., Sawyer-Tower Inc., Watertown 72, Mass.
Scott Aviation Corp., 207 Erie St., Lancaster, N. Y.
Seagrave Corp., 2000 S. High St., Columbus 7, Ohio
Service Belt Co., Inc., 810 Broadway, New York 3, N. Y.
Sharpsville Steel Fabricators, Inc., 6th & Main Sts., Sharpsville, Pa.
Sireno Co., Inc., 214 Williams St., New York 38, N. Y.
Smith, D. B., & Co., 414 Main St., Utica 2, N. Y.
Snyder, M. L., & Son, Inc., 2417 N. Jasper St., Philadelphia 25, Pa.
S-T Hydrant Wrench Co., P. O. Box 921, Holyoke, Mass.
Standard Alarm & Signal Co., 55 Industrial Rd., Berkeley Heights, N. J.
Stephenson Corp., Red Bank, N. J.
Sterling Siren Fire Alarm Co., Inc., 8 Bartlett St., Rochester 8, N. Y.
Superior Coach Corp., E. Kibby St., Lima, Ohio
Superior Signal Co., Inc., 6 Colfax St., South River, N. J.
Super Vacuum Manufacturing Co., Inc., 319½ E. 17th Ave., Denver 3, Colo.

Thermoid Company, 200 Whitehand Rd., Trenton, N. J.
Trippe Manufacturing Co., 133 N. Jefferson St., Chicago 6, Ill.

U-C Lite Mfg. Co., 1050 W. Hubbard St., Chicago 22, Ill.
Universal Fire Apparatus Corp., P. O. Box 187, Logansport, Ind.
University Loudspeakers, Inc., 80 So. Kensico Ave., White Plains, N. Y.
Unox Co., The, Div. of McFarland Mfg. Corp., 1630 Roberts St., Houston 3, Tex.

Ward LaFrance International Inc., Grand Central Ave., Elmira, N. Y.
Ward LaFrance Truck Corp., Grand Central Ave., Elmira, N. Y.
Washington Products Co., Div. Washington Mortuary Supply Co., 238 S. Fayette St., Washington Court House, Ohio
Waterous Co., 80 E. Fillmore Ave., St. Paul 1, Minn.
Waukesha Motor Co., West St. Paul Ave., Waukesha, Wis.
W-B Manufacturing Co., 157 No. Wasco St., Wichita, Kans.
Wentworth-Forman Co., Inc., 21 Edinboro St., Boston 11, Mass.
Winpower Mfg. Co., Newton, Iowa
Wooster Brass Div., The Fyr-Fyter Co., 1415 E. Bowman St., Wooster, Ohio

Young Fire Equipment Corp., 1548 William St., Buffalo 6, N. Y.

Every effort is made to insure the completeness and accuracy of directory sections. However, this information is published as a service, and no guarantee against errors or omissions is expressed or inferred. Additions or corrections are invited at any time. Please address the publisher.

"EUREKA Multiple-Woven Hose gives us an average service life of over 15 years!"

"Over a period of more than 30 years, we have used Eureka's *Paragon* Multiple-Woven hose," states the Chief* of an Eastern municipality's fire department. "Our records show that it gives us an *average* useful service life of over 15 years. Some sections have remained in serviceable condition for 20 years or more.

"This is about 3 or 4 times the useful service we might expect from the lowest-priced approved hose. So Eureka actually gives us nearly twice as much service for every dollar.

"Besides, we know that Eureka *Paragon* hose won't let us down when the pressure is on! I've watched it being made in your plant on the unique loom that weaves all plies at one time and interweaves them into a single jacket of amazing strength and wearing ability. That's why I've never hesitated to push hose pressure to the limit when it was needed."

Let your Eureka representative show you all the reasons why Eureka Multiple-Woven is your best hose buy. Of course, if conditions beyond your control force you to get the most footage for your present hose allotment, he can also show you Eureka's lower-priced approved hose. Write or wire to have him call. Remember, he is a specialist in fire hose!

*Name on request

Note how criss-crossing vertical cords tie all plies into one solid body.

"For greater protection to life and property"

EUREKA FIRE HOSE

Since 1875, Specialists in Manufacturing Circular-Woven Rubber-Lined Fire Hose

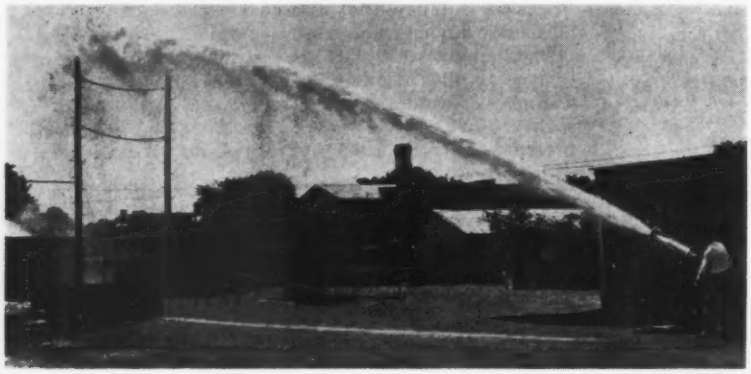
1 Market Street Passaic, New Jersey *Division of* **United States Rubber**

WHAT'S NEW

Among the Manufacturers

- products
- processes
- personalities

New National Foam Multi-Purpose Nozzle



National Foam System, Inc., West Chester, Pa., has announced a new multi-purpose fire fighting nozzle, Model PW-50, which should interest fire protection engineers and fire fighters concerned with flammable liquid hazards.

The new product shifts quickly from straight stream to spray stream operation, using either foam solution or water to kill fires on the ground, in sludge or settling pits, or ponds and large dike areas. It may be mounted on foam trucks, fireboats or crash apparatus, or used with fixed piping near refinery and other units.

Depending upon operating pressure, volumes of up to 4,600 gpm of foam can be obtained with foam stream range up to 200 feet; spray stream operation produces an effective spray pattern up to 88 feet. nozzle weight is 54 pounds. It measures 40 inches over-all length and has 2½-inch connection for hose or pipe.

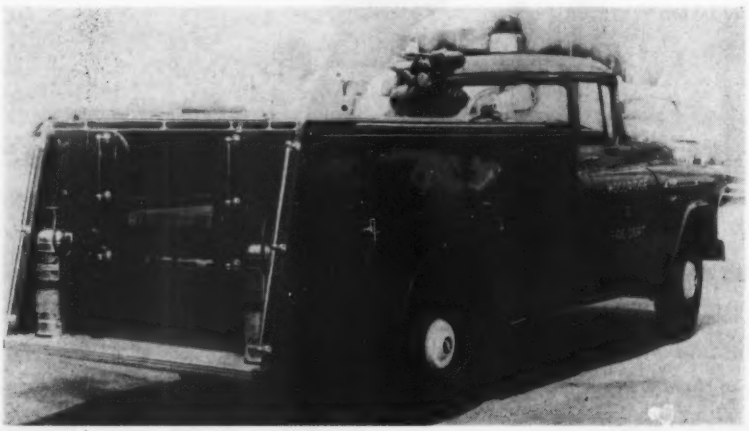
Versatile Body for Rescue or Squad Units Announced

A versatile new body to fit any conventional cab and chassis for rescue or squad truck use has been developed by Reading Body Works, Reading, Pa.

The unit can be custom engineered to meet any individual requirements. The body is streamlined, compact, of rugged construction and designed and engineered to function as a self-sustaining unit or to support any other mobile fire or rescue unit a fire department may have. Adaptable for any standard chassis, the units are available in sizes from ½ to 1½-ton, with body sizes from 6½ to 11 feet.

The amount of equipment the body will carry depends upon size. In addition, there is substantial space for auxiliary fire extinguishers, etc. Or, if desired, the unit can be equipped with full-length lift-up seats over extra storage bins.

Complete information may be had by writing the above company.



Transistorized Mobile Speaker

The first mobile communications type speaker with a built-in transistor amplifier has been announced by Motorola. The "Power Voice" speaker provides up to ten times the audio output of standard passive speakers in mobile two-way radio installations.

The transistor amplifier utilizes two power transistors and has a flat response from 300 to 3000 cps. The 3.2 ohm input impedance is compatible with most communications type receivers. Battery drain is very low, being less than 0.3 ampere on standby and 1.0 ampere with full voice output.

Approximately 1 watt input to the amplifier provides 15 watts output in 12-volt vehicles and 5 watts output in 6-volt vehicles. Speaker output is varied with the usual receiver volume control by controlling the input to the transistor amplifier. The unit is easily removed from its mounting bracket and hung outside the vehicle window to enable monitoring of received messages from a considerable distance away.

Additional information is available from Motorola Communications and Electronics, Inc., Technical Information Center, 4501 West Augusta Boulevard, Chicago 51, Ill.

New Winco Generating Plants

Two direct-drive generating plants have been added to the Winco line of engine-generators manufactured by the Wincharger Corporation of Sioux City, Iowa.

The two new units, both designed to run at 1800 rpm, supplement the manufacturer's already extensive line that includes both 3600 rpm direct-coupled models and belt-connected styles.

The Series 2B23S4D is rated at 2,000 watts. The 102B14S4D is rated at 1,250 watts. Both units are available with either manual or remote start and they can be supplied with a two-wheeled dolly or with a carrying cradle. Both are driven by a Briggs & Stratton engine.

FWD Demonstration Tours

Fire chiefs and firemen throughout the Southeast, Gulf Coast, Midwest, West and Northwest sections of the United States are getting an opportunity to see and try new combination electric or manual control pumping engines during another series of Four Wheel Drive Auto Company fire apparatus demonstration tours begun early in September.

The tours, featuring FWD's Special "750" pumper, started in North Carolina and will continue through Georgia, South Carolina and Gulf Coast regions. Other units will swing through the Midwest, Southern California and Northwest in November.

The Class A pumpers are equipped with electric priming pump and have electric controls for shifting and operation of the transfer valve to provide either

Continued on page 1001

NEW!

STREAM SELECTORS

Guaranteed Gallonage

FOG-HOG®

Easy to use Stream Selector. You set your stream, 30°, 60°, 90°, or straight stream before you turn on the water. Especially valuable in ladder pipe operation. You see exactly what you're doing at all angles . . . because Stream Selector is visible for 360°.

- **Polished Brass or Chrome Plated Brass.**
- **VERSATILE—Use on ladder pipes, deluge sets, deck pipes and monitors.**
- **Solid fog or non-feathering, long-range straight stream.**
- **"O" ring seals for easy adjustment and years of trouble-free service.**
- **ROCKER LUG—Easy positive attachment.**

SIZES

500 G.P.M.
Style No. 1245

1000 G.P.M.
Style No. 1247

2500 G.P.M.
Style No. 1248

AKRON BRASS
FIRE FIGHTING EQUIPMENT

Visit Us at Booths No. 52-53 at the I.A.F.C. Convention

AKRON BRASS MFG. CO., INC. • WOOSTER, OHIO

FALSE ALARMS

Our idea of a wise woman is one who makes her husband think he is head of the house when the truth is, he's only head of the entertainment committee.

That Tight Little Isle

Ghief Coupling just returned from a vacation in England. The thing that most impressed him, he said, was the way they let the water pipes wander all over the outside of the houses, and on the roofs. He said when he asked a plumber why they did it, the answer was, "That's to make it easier for 'em to get at the pipes when they freeze."

Volunteering as a blood donor in a Texas hospital, a young woman was asked by the nurse, "Do you know your type?"

"Oh yes," came the reply, "I'm the sultry type."

There's One in Every Outfit!

The captain was sore. Johnny-come-lately was living up to his name—he was missing from the a.m. roll-call. The captain dismissed the line-up. Just then Johnny came ambling in.

"You shoulda been here at eight," the captain barked.

"Why," replied Johnny, "What happened?"

The handsome young proby leaned over the perfumery counter. "Now here's a perfume she'll like, the clerk said. "It's called *Perhaps*. It's $25 an ounce."

"Twenty-five dollars!" exclaimed the proby. "For $25 I dont want any *Perhaps*—I want *Sure*!"

Absent in Mind Only

Then there is that one about the absent-minded professor whose wife was giving birth in the hospital. His secretary came rushing in and said, "Professor, you are the father of an eight-pound bouncing baby boy!" And the prof' said, "Why be so emotional about it, my wife takes care of all those details."

"Are you a good little boy?"

"Naw! I'm the kind of a little stinker my ma don't want me to play with."

Salesman: "I've been trying for a month to see you. When may I have an appointment?"

Tycoon: "Make a date with my secretary."

Salesmen: "I did, sir, and did we have a swell time! But I still want to see you."

"Do you know Ann Hathaway?"
"Oh boy! Hasn't she?"

Then there's the one about the mind-reader who moved out to Hollywood to go into business. He starved to death.

She: "Fireman, you'd better watch your arm!"

Fireman: "Oh, don't worry—it knows its way around!"

The chief was looking over the list of committees for the coming firemen's conference.

"Here's one name on this committee I never heard of," he said.

"Oh, him, he's probably the guy who actually does the work," came the reply.

"Who's in charge here?"

Mr. Henpecked to doctor over the telephone: "Doctor, my wife just dislocated her jaw. If you should be out this way next week, or the week after, you might drop in and take a look at her, if you've got time and happen to think of it.

The Spirit's the Thing

An agent knocked on the door of a house in the suburbs. "I have something here," he said to the man of the house, "which will make your life happier and bring you a host of friends."

"Good, replied the householder, "I'll take a coupla quarts."

Overheard at the fire college: "If you can't find a job that involves doing nothing at all, the next best thing is to be employed in an advisory capacity for the formation of a master plan."

Army Hospital

Sweet young thing: "I'm going over to the hospital to hold hands with the sick soldiers."

Practical housemother: "Well, use a firm grip!"

Patient: "I dream every night about baseball."

Doctor: "Don't you ever dream about anything else—like girls, for instance?"

Patient: "What—and miss my turn at bat?"

Sweet young bride: "Because of the way you spoke to her on the phone this morning, the maid's given notice."

Tender bridegroom: Ohmigosh! I thought I was talking to you."

"What is home without a mother?" the GI asked with a sigh.

"I am tonight," replied the little blue-eyed blonde.

A student nurse was being shown around the Navy hospital by the head nurse. Her guide opened the door to a ward. "These are the dangerous cases," she warned, "They're almost well!"

At a dinner one night Chauncey M. Depew joined a small group of friends who were engaged in an animated discussion.

"Oh, Mr. Depew," exclaimed one of the ladies, "you are just in time to settle an argument. What is the most beautiful thing in the world?"

"A beautiful woman," replied the gallant Depew without hesitation.

But his companion seemed shocked at his levity. "I contend," she said seriously, "that sleep is the most beautiful."

"Well," said Depew thoughtfully, "next to a beautiful woman, sleep is!"

Veteran Smokeater: "Son, make love to every woman you meet. If you get 5 per cent of your outlay, it's a good investment."

CONGRATULATIONS

IAFC

The International Association of Fire Chiefs is to be commended for the splendid work it is doing toward the advancement of the Fire Service.

The Bi-Lateral Fire Hose Company says:

"Every Fire Chief should be a member of IAFC"

ALABAMA, TUSCALOOSA
Sam Davis
1300 10th St.

CALIFORNIA, ENCINO
Dick Cornell
5126 Encino Ave.

COLORADO, DENVER
Paul Nelson
Nelson Fire Equip. Co.
920 Inca St.

CONNECTICUT, OLD GREENWICH
Orville A. Sawyer
P. O. Box 73

FLORIDA, JACKSONVILLE
W. Q. Dowling
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BI-LATERAL'S DISTRIBUTORS AND DEALERS throughout the country join the Bi-Lateral Fire Hose Company in their full co-operation with INTERNATIONAL at all times.

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Nip Brush Fires in the Bud with an FZZ

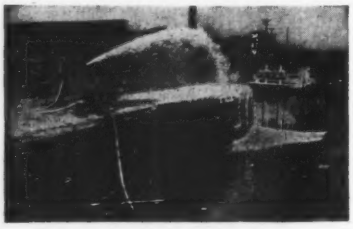
The HALE TYPE FZZ IS MIGHTY HANDY FOR FIGHTING FIELD, BRUSH & FOREST FIRES FROM TRUCK IN MOTION

Above and at bottom are two on-the-spot pictures showing a HALE Type FZZ Portable Fire Pumping Unit fighting a brush fire from a moving truck. An FZZ can be mounted or carried on any type of equipment, making it a real "work-horse" for fighting brush, field and forest fires while in motion. Booster tank is used for a source of water.

The Hale Type FZZ is a powerful, sturdy, ready-to-use unit built specifically for fire fighting. Compact, dependable and efficient, it will stand long hours of continuous pumping.

Above—FZZ Pumping solid stream and fog.

Above—FZZ Relaying through Major Pumper.



Above—FZZ Pumping Foam (Foam proportioner built in if specified.)

Performance substantially exceeds NBFU and NFPA capacity and pressure requirements. It can supply from draft, two capable fire streams through 1½" hose lines.

NOTE: Discharge adapter can be supplied for use with 2½" hose.

Available in carrying frame; mounted on two wheels; or mounted on rubber-cushioned steel channels.

NOTE:

FZZ Now Has NEW—

- **Ball-Type Valve**
- **Improved priming**
- **Mechanical seal**

• *Write today for FZZ Circular. Ask for Demonstration.*

HALE FIRE PUMP COMPANY
Conshohocken, Pa.

• Fire Pumps in All Standard Capacities

FIRE SERVICE PROGRESS

Continued from page 899

The effectiveness of this method of teaching fire fighting was well illustrated during World War II when Captain H. J. Burke, USNR (later Chief of the New York City Fire Department), set up schools to instruct sailors in fire fighting. Before these trainees were supplied to carriers and other warships, many craft, including various types of combat ships had been victims of raging fires. After the fire-trained sailors had been supplied to all Navy ships, not one was lost to fire. Though fires of tremendous proportion occurred in the carriers Franklin, Bunker Hill, Intrepid, Saratoga, Enterprise, Hancock and others, fire was controlled in each case and all reached port safely.

Other developments which may be looked for in the fire service in the future include wider use of respiratory protective equipment. Today, no fire officer knows what lethal fumes he may encounter even in the smaller factory fire. The complexity of chemical processes today and the rapidly growing host of chemical compounds will make mandatory complete protection of fire fighters.

Also, the detection of dangerous gases as well as radioactive substances at fires may become a common procedure with tomorrow's firemen.

Company inspection of buildings, using radio to keep in contact with fire headquarters, will continue to gain in the coming years. It has proven itself.

Following the successful use of lightweight portable television cameras at the recent San Francisco political convention, we may expect to find growing interest in this new development by the fire service. It is not hard to visualize the tremendous help it would be to a fire chief if he could, by the flick of a switch, see what was taking place on all sides of, and within a fire building.

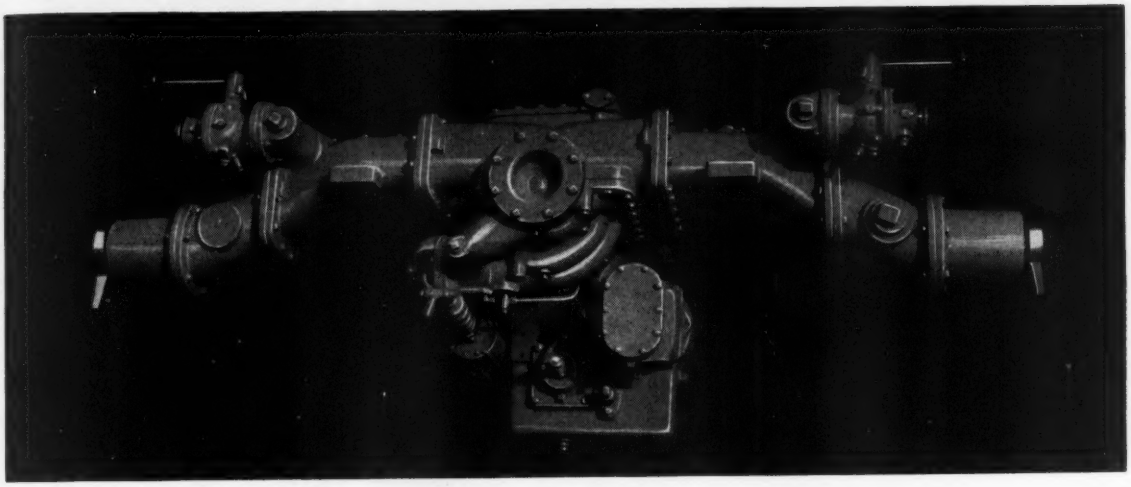
Finally, mutual aid setups, though near perfect in some parts of the country, will be even further improved. Better coordination of fire departments will come with experience. The time is near when every community in the country will have added protection against disastrous fires and major emergencies provided by mutual aid organizations. □□

Forest Fire Threatens Town; Train Ready for Evacuation

On July 23rd a train was standing by at Mercoal, Alta., ready to evacuate that coal-mining town if the danger from an out-of-control forest fire became acute. The fire had burned to within four miles of the community despite the efforts of 150 men equipped with 13 bulldozers and other tools.

T. R. Hammer, Provincial Forest Protection Supervisor, estimated the fire had covered 15 to 20 sections since it began. Twelve other fires, believed started by lightning were reported in the Alberta area. Three helicopters were used to fly in fire fighters and equipment.

Completely Modern
HALE QLHD and QL75HD TWO STAGE FIRE PUMPS



UNDERWRITERS' RATING:	Rating
● QLHD	500 GPM at 150 lbs.
● QLHD	600 GPM at 150 lbs.
● QL75HD	750 GPM at 150 lbs.

PLUS FEATURES:

LOW OVER-ALL HEIGHT—The low over-all height of the pump above the frame provides substantially more room for tank, compartments, or hose space.

DUAL PRESSURE—VOLUME CONTROL—Push-button and Manual with NEW Visual Indicator which shows operator instantly whether pump is in Volume or Pressure position.

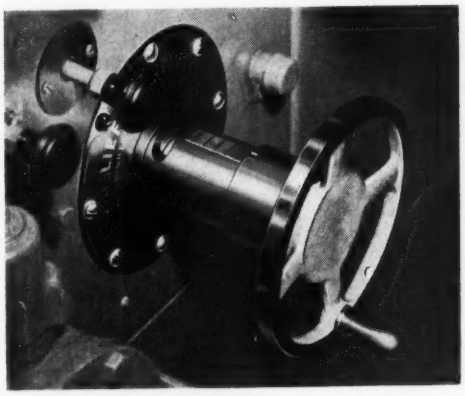
PANEL MOUNTED RELIEF VALVE CONTROL—A convenient wheel on panel makes it easy to set relief valve quickly and accurately. See picture at right.

DEEP DROP TO FIT MODERN CHASSIS—The QLHD and QL75HD Series is designed with a Deep Drop between mounting pads and center line of drive shaft to fit up-to-date truck chassis—an important aid in engineering the pump into the chassis.

EASIER TO SERVICE—The new design makes it convenient to service pump from the bottom for inspection—or minor repairs. Lower half of pump, or whole pump can be dropped down between frame without marring enclosure panels or disturbing gauges or instruments.

DUAL PRIMING CONTROL—(Push-button and Manual); a popular and improved feature.

BUILT-IN SPEED COUNTER—Provides convenient way to measure propeller shaft speeds.

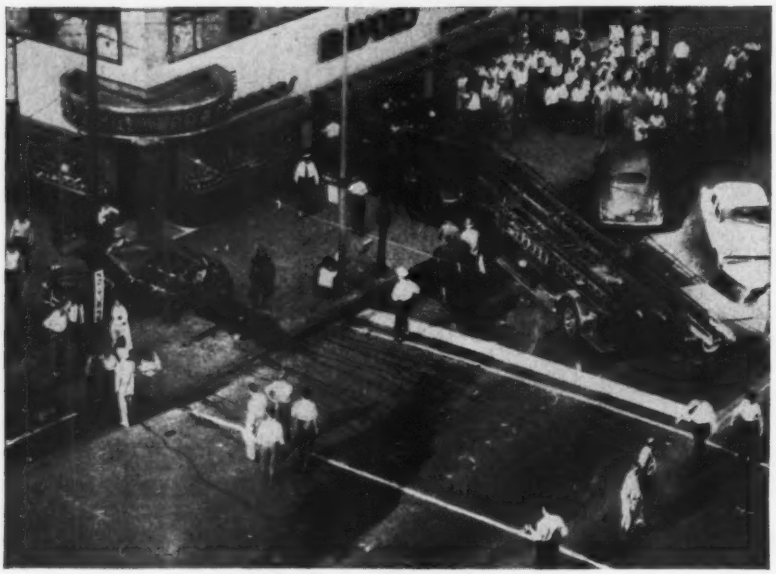


This Hale "QL" Relief Valve Control with handy "Setting" Wheel shown above is now available for all Hale single, 2 and 3-stage Centrifugal Pumps that use a Hale Relief Valve, *regardless of age*. The wheel Control is now standard on all present Hale centrifugal fire engine pumps, and can be easily mounted on all older single, 2 and 3-stage Hale centrifugals in service. It can be mounted directly over the Relief Valve, or Panel-mounted as pictured above, to replace the older style knurled Control.

Write for New Bulletin 334 on HALE QLHD and QL75HD Centrifugal Pumps.
HALE Pumps are Built in all Standard Capacities

HALE FIRE PUMP CO.
CONSHOHOCKEN, PA.

Eliminate This!



with **EL-TEC**

RADIO TRAFFIC CONTROLLERS

Crashes like this Cost Lives . . . Property . . . Money . . . and tie-up badly needed equipment and highly trained personnel. *These tragedies virtually can be eliminated!*

The driver of an emergency vehicle can have uncontested, clear right-of-way for blocks ahead . . . he can stop all traffic on his route. He does it with EL-TEC, an electronics system for controlling traffic from a moving emergency vehicle.

EL-TEC is new, but years of research and development have proved its dependability. The system and equipment have been hailed as the most important stride in emergency traffic safety in many years.

EL-TEC has been commended by the nation's leading police, fire and traffic officials as well as various State Safety Committees and Highway Commissions.

SEE US AT THE I. A. F. C. CONVENTION BOOTH NO. 24

Electronic Protection Inc.

Subsidiary of Standard Coil Products Co. Inc.

2081 North Hawthorne Avenue - Melrose Park, Illinois

The Only FCC Approved System For Emergency Traffic Control

6401

GET THE FACTS!
SEND COUPON TODAY!

You owe it to yourself, your community, your firemen, policemen and all emergency drivers to learn how low-cost, reliable EL-TEC Radio Traffic Controllers can save lives, prevent suffering, cut down property damage, keep all emergency equipment "in service."

ELECTRONIC PROTECTION INC.
Subsidiary of Standard Coil Products Co. Inc.
2081 North Hawthorne Avenue, Melrose Park, Illinois.
☐ Please have representative call.
☐ Please send literature on EL-TEC.
Name_____
Title_____
Address_____
City_____ State_____

FIRE SERVICE COMMUNICATIONS

Continued from page 919

entific advancement in fire service communications.

In the fire alarm field considerable hope is advanced for a radio fire alarm system that will augment existing street telegraph or telephone boxes. The first "wireless" box was demonstrated in Chicago at an International Municipal Signal Association conference a dozen years ago. Shortly after, a working installation was successfully demonstrated at the University of Maryland. Today several concerns have pilot models under test.

With the increased applications of the transistor, lifetime batteries, sun power and other means, the radio box has been brought just so much nearer fruition.

Such handicaps as frequency allocation in the present crowded spectrum, signal interference, skip and freak atmospheric conditions, the questions of supervision and maintenance must be and, we believe, will be ultimately overcome to provide a successful product.

Television applications

Since the advent of commercial television, its possible applications in the fire service have been receiving attention. Although nothing startling has as yet resulted, the recent announcement of a successful method of transmitting television images over common telephone circuits offers an avenue of application.

It is entirely conceivable that by this means a new and workable method for deterring false alarms may eventuate. Used in conjunction with a street alarm box, a dispatcher could see the person sending in an alarm, and by photography, a permanent record of the sender would be possible.

Fire detection and reporting

These "silent watchmen" are on duty and ready to communicate their findings

—Photo courtesy Bell Telephone Laboratories

Introduction by Bell Laboratories of a successful method of transmitting television images over ordinary telephone lines may point the way to a workable false alarm deterrent

at all times, whether to a central reporting station for retransmission to the fire service or directly to fire headquarters.

This essential service has been increasing in importance and scope in recent years. One company which specializes in this field reports that previously they had limited their services to those cities where it was possible to maintain a central office for direct supervision. As decentralization of industry and business became more of a reality, the company extended its operations, until today it has over 60,000 installations in some 1,600 localities. Where in some places central office supervision is not available, the alarm transmission is made direct to the local fire alarm center.

Many students envisage the greatest room for advancement in communications to be in the field of fire detection and alarm transmission. Just as fire prevention is rated our most important requisite, so early discovery of fire and its report to the fire department is likewise paramount.

New individual devices and elaborate systems for automatically detecting fire are being combined with scientific automatic extinguishing systems for every sort of occupancy. The fire service is displaying more interest in these facilities and their installation than ever before. It is also through its expanding inspection program, becoming active sales ambassadors for the manufacturers of such equipment.

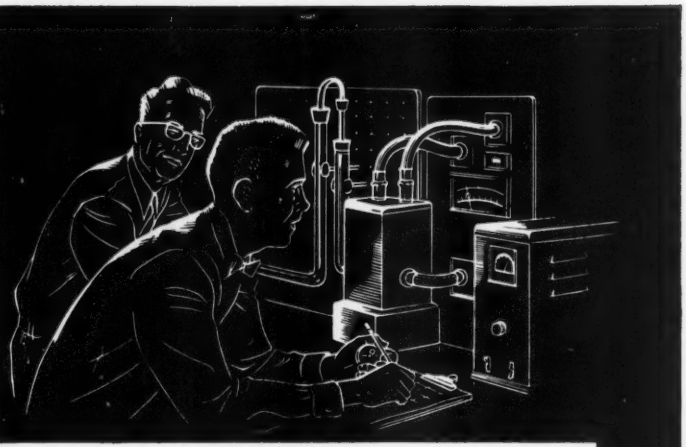
Much research and engineering has been expended on the various methods of detection and reporting fires. At present no one system apparently meets all requirements, but there exists a wide variety of sprinkler alarms, smoke detectors, heat detectors and the like, engineered to meet the needs of the property to be protected.

The latest innovation is a system which makes use of nuclear energy for sounding an alarm. According to its makers, it does not require heat, smoke or flame to actuate it, but merely the combustion gases. The detector head contains a cold cathode discharge tube and two ionization chambers, one of which is exposed to the atmosphere while the other is virtually sealed off. Each of the chambers contains a tiny foil of radium. When the combustion gases enter the detector head, a voltage increase is caused which ignites the cold cathode tube, making it electrically conductive. This in turn operates a relay that may set off a fire alarm, close fire doors or perform any additional operation that may be electro-mechanically controlled.

One requirement of all detection systems is the need for proper maintenance. Generally speaking, the various companies which produce the systems will also contract for their care. In some areas where insurance credit is given for this type of protection, the rating or inspection bureaus require a contract for maintenance before credit will be given.

Recording devices become fixtures

Fire alarm telegraph recording by means of tape and associated time stamp,



With that new production process . . .

A NEW FIRE HAZARD?

When you develop new processing techniques, don't overlook the **new fire hazards they may create . . .** particularly where flammable liquids are involved. Consult National Foam to obtain recommendations for proper fire protection. There is no obligation, of course.

NATIONAL FOAM System, Inc.
West Chester, Pa.

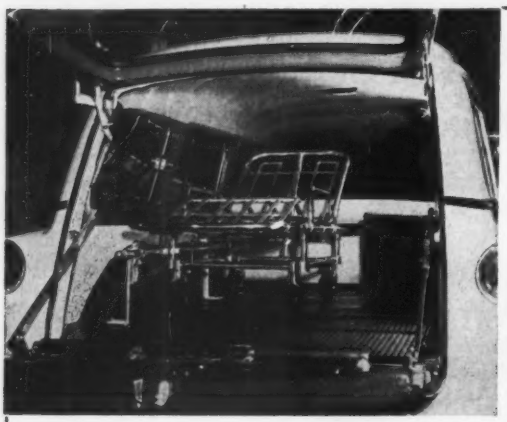
NATIONAL FOAM FIRE PROTECTION SYSTEM

The only company exclusively engaged in the design, development and manufacture of foam fire protection equipment and chemicals.

has long provided uniform, factual recordings of alarms received and transmitted. But with the increasing volume of telephone communications and the possibility of errors in the receipt of such alarms and their transmission, and equally important, the great growth in the use of radio voice communications, the necessity of recording audio signals and messages has become imperative in the fire service.

The removal of FCC restrictions on recording of telephone messages, permitting recorders to be connected to telephone circuits, was an important step forward. The recording of radio conversations was another progressive move.

There are a number of different mechanical recorders adaptable for fire department use, both automatic and manually controlled. These provide a complete record of the voice communications of the fire alarm center. And they go further: They improve operating efficiency by establishing the source of errors in the receipt and transmission of fire alarms and in routine fire department communications. They also provide factual evidence for use in detecting and convicting false alarm senders. And they are finding ever-increasing use in instruction and training in firemanship and in the recording for posterity of the proceedings of important meetings and conferences.



WASHINGTON

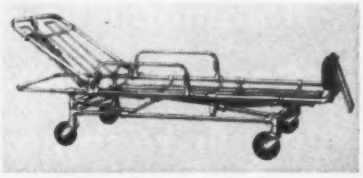
STATION WAGON CONVERSION COT AND STRETCHER KITS

←

Washington full senior size Kontour-Kot with 5" cushion tires, in a Ford country sedan.

WASHINGTON MAKES A COMPLETE LINE of station wagon conversion cot and stretcher kits—with models available to fit any make or model wagon. Installation is simple, and removal is quickly accomplished in a few minutes—leaving the wagon floor clear. Washington cots and stretchers are the first choice for any emergency vehicle, as well as the favorite for emergency rooms, industrial first aid stations and plant hospitals. If you are in doubt as to the proper kit; write us giving the type and model of station wagon, and we will advise you of the most suitable model, with prices.

WASHINGTON MAKES COTS AND STRETCHERS TO FIT ANY VEHICLE, OR FOR ANY FIRST AID ROOM OR HOSPITAL REQUIREMENT



Two-level elevating ambulance cot, Model 52—A Washington exclusive design.

Washington's COMPLETE LINE of ambulance cots and stretchers and other emergency equipment can meet your every requirement. For over 32 years, Washington has constantly featured the highest quality and best craftsmanship in the industry. First aid and rescue squads, fire departments, hospitals, factory hospital and first aid rooms are but a few of the thousands of satisfied users of Washington products.

Fold-A-Way emergency stretcher, Model 18. Light and compact, folds easily.

Visit us at Booth #89 at the I.A.F.C. convention in Miami, Fla., Nov. 12 to 16.

WRITE FOR FREE CATALOG

WASHINGTON PRODUCTS CO.

238 SOUTH FAYETTE ST., WASHINGTON C. H., OHIO

Voice amplification progresses

From the early days of fire fighting, efforts have been made to improve voice communications. The historic fire trumpet is an example. But it was not until the application of electronics to this problem that tangible results were obtained. Today electronic amplifiers have found widespread acceptance in the fire service not only for on-the-fire-ground operations, but for training, mass dissemination of orders and instructions and in a variety of rescue and disaster applications.

A built-in transistor amplifier provides greater audio output from this mobile speaker. The unit is easily removed from its mounting bracket and hung in a convenient position for monitoring—*Photo courtesy Motorola*

Light in weight, self-contained and battery-operated, these portable units can project the voice great distances on a clear directional path over ambient noise interference with minimum distraction to other communications.

—*Photo courtesy Audio Equipment Co.*

This modern speaking trumpet is electronic powered and can project the voice over great distances. For maximum power a shoulder strap carried amplifier and battery pack model is used, although the self-contained models suffice for normal operations

Need for training grows

With the broadening applications of radio and both wired and electronic fire detection and alarm transmission, the necessity of adequate training of communication personnel is more imperative than ever.

Fire communications in the past called

LOOK FOR THE FORD BOOTH

International Association of Fire Chiefs Convention, Dinner Key Auditorium, Miami Beach, Florida. Booth 34, and Auto Display Space 1. Nov. 12-15

FREE

Money-Saving Facts . . . in new Ford 12-page booklet

Here's just a sample of what you get in this up-to-date, illustrated free booklet.

Comprehensive list of 39 fire equipment manufacturers and illustrations of equipment.. **Pages 2 & 3**

Illustrations and descriptions of typical Pumpers, Tankers, Hose and Ladder Trucks... **Pages 4 & 5**

Aids to selecting Fire Truck Chassis for Professional and Industrial Fire Departments..... **Pages 6 & 7**

Typical Pump and Tank Installations.. **Pages 6 & 7**

Top Pumping Power, High-Torque, Fast Acceleration and dependable, long-lasting Service with Ford's modern Short Stroke engines.... **Pages 8 & 9**

Explanation of basic Fire Pump Principles..... **Page 10**

How to select the right engine and truck model for pumping requirements..... **Pages 10 & 11**

Ford's Inspection, Patrol & Emergency Vehicles..... **Page 12**

MAIL THIS COUPON TODAY!

FREE

FORD Division of FORD MOTOR CO.
P. O. Box 658, Dearborn, Michigan

Please send me your free 12-page booklet "The Right Truck to meet your Fire Fighting Requirements."

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ADDRESS_____

CITY_____ STATE_____

F-1 Check here if student ☐

YESTERDAY...

Fires Were Fought by DEFENSE

1931... Firemen are shown battling a four-alarm fire of possible incendiary origin which destroyed a cooperage plant and warehouse in California early today, doing an estimated $100,000 damage and injuring two firemen. Great clouds of smoke and flame from the fiercely burning structure covered a quarter of a block. (Int. News Photo)

TODAY... IT'S FIRE ATTACK!

Scott Air-Paks

ARE FIRE ATTACK EQUIPMENT!

YOURS IS A **FIRE ATTACK** DEPARTMENT IF YOU HAVE SCOTT AIR-PAKS ON EVERY FIRE TRUCK

As early as 1948 the editor of Fire Engineering urged more concentration on *FIRE ATTACK* and less on FIRE DEFENSE. ". . . Lack of respiratory protective equipment . . . has not only been responsible for slowing up *FIRE ATTACK* but has resulted in the incapacitation of too many good firefighters."

Today SCOTT AIR-PAKS get men in fast for efficient *FIRE ATTACK* with complete breathing safety! Result, more lives saved and fire losses reduced to a minimum. Take steps NOW to make yours a *FIRE ATTACK* department. Write for complete information.

VISION UNLIMITED

New Scottoramic Face Mask now available for all Scott equipment, (standard on most models), and for replacement on your present breathing apparatus.

SINCE 1932 Scott FOR SAFETY—FOR SERVICE

SAFETY EQUIPMENT DIVISION

SCOTT AVIATION CORP.

215 ERIE STREET LANCASTER, N. Y.

Canada: Safety Supply Co., Toronto — Branches in principal cities
Export: Southern Oxygen Co., 15 West 57th Street, New York 19, N. Y.

for only a minimum of personnel in fire alarm central stations and in the field. The advent of radio called for an entirely new approach to the fire communications problem, from the personnel viewpoint at least.

With the adoption of mobile radio came the need for training not alone departmental communications personnel, but all fire fighting operating personnel who must, of necessity, at one time or another be obliged to use the equipment.

All this progressive development has raised the level of intelligence requirements for fire service communications personnel. Higher standards have opened the door to men of higher intellectual calibre. At the same time, they have raised the standards of training in all branches of fire service communications.

To meet this challenge, fire schools and colleges on the state, local and even national level, are instituting appropriate courses in communications. Procedures for operating radio in all its ramifications have been adopted by the fire service. Some of these recommended procedures have the endorsement of organizations such as the National Board of Fire Underwriters, the International Association of Fire Chiefs, the National Fire Protection Association and the International Municipal Signal Association.

Science has entered into fire service communications as never before. It is a good augury for the future. □□

Quick-Thinking Theatre Manager Averts Panic

A theatre manager in Livingston Manor, N. Y., is credited with averting panic and possible disaster by some fast thinking and persuasive talking when fire threatened a Saturday night crowd recently.

Leonard Thompson, manager of the Manor Theatre and a Livingston Manor Fire Department member, was notified that a fire had been discovered in a building next door and that the flames were already coming out of the windows into the alley where the theatre's emergency exits were located. Ordering the projectionist to shut off the film and turn on the house lights, Mr. Thompson calmly walked down the center aisle, asked the audience's attention, and announced that an unusual test was to be held right then.

He instructed the entire audience to exit, using only the front doors, and to turn right when they reached the street (by turning right the patrons would be walking away from the fire). Thompson explained that return tickets would be given to all, and that the show would resume when the test was over.

The manager-fireman has been noted for his talents as a side show barker at volunteer fire department carnivals. Bringing all his showmanship into plan and in his best midway manner, he soon had the crowd moving toward the doors. Keeping up a continuous line of chatter, he talked and prodded the patrons out of the theatre. As they emerged, police took over and kept them moving away from

the danger scene. Inasmuch as the flames were not visible in the front of the building at the time, many were completely unaware of the fire until mutual aid companies began arriving.

When the flames burst into the sky, the movie patrons were given a show far more dramatic than the film they had been watching. At the same time they became aware of the diplomatic manner in which the manager had emptied the theatre. Many of them thanked Mr. Thompson for his efforts in saving them from possible injury or death.

LeRoy Gates

Passaic Firemen Reluctant to Drive Apparatus

Because of legal complications arising from an accident involving a fire truck and a chief's car in December 1955, firemen of the Passaic, N. J., Department have expressed their reluctance to drive the city vehicles. In a collision with a fire truck driven by Lieutenant Emil Stefanacci, Deputy Chief John V. Doremus and his driver, Edmund C. Hutchinson, lost their lives while responding to an alarm.

The insurance company which carries the city's insurance has denied liability, claiming that its policy with the city does not cover instances where all persons involved are city employees. When firemen learned of the insurance company's position, they voiced their reluctance to drive city-owned vehicles to the officers of the Firemen's Mutual Benefit Association.

As a result of this position by the insurance carrier, Lieutenant Stefanacci filed suit through his attorney against the city and the estates of the two firemen killed in the accident. The estate of Fireman Hutchinson, in turn, filed suit against all others involved. The Passaic City Counsel has announced that he would seek a declaratory judgment against the insurance company holding it liable under the policy, before becoming involved in the various suits against the city.

CENTRIFUGAL FIRE PUMP

Continued from page 923

number, to better govern every single pumping operation, yet there will be greater simplicity and efficiency of operation. Just as today, while practically all motor vehicles are increasing the application of automatic features and this may entail more controls, it cannot be denied that automation does make for simpler and more convenient operation.

Not everyone will agree with the principles of automation as applied to fire department vehicular operation, but neither did many automotive manufacturers and distributors accept it at the outset. Nevertheless, history tells us we seldom, if ever, return to old methods, old principles, once a newer, better way to do things has been well introduced. This has thus far been the experience in pumping progress. So it may prove in the future. □□

"Another Life Saved! Our Record's Tops with Scott EQUIPMENT"

* Scott Air-Pak uses pure air (not oxygen) for fighting fires or rescuing victims.

* Scott Inhalators use oxygen or oxygen mixtures for reviving victims.

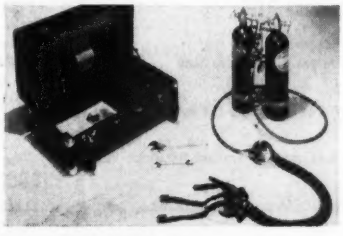
Scott DEMAND INHALATORS

"Emergency call from the watch desk — Rescue squad needed — man overcome. Minutes later he was feeling better, revived with our Scott Demand Inhalator. Makes you feel good to help folks like this.

"These efficient, portable oxygen units are wonderful for emergency service. Victims get 100% concentration — comfortably — thanks to the demand feature. We can also provide constant flow by pressing a button. The demand feature is fully automatic and cuts down training time."

SCOTT Air-Paks (illustrated on fireman at top left) enable rescue crews to reach victims under the most hazardous breathing conditions. Air-Paks assure the wearer constant supplies of cool, fresh AIR (not oxygen) for quick rescues with maximum safety. Do as hundreds of other fire departments have done . . . specify SCOTT.

TYPE A—for fixed installation in truck or ambulance.



TYPE B—portable, including carrying case (with or without cylinders).

SINCE 1932

Ask your distributor for FREE DEMONSTRATION or write us today!

MEDICAL DIVISION
SCOTT AVIATION CORPORATION
215 ERIE STREET, LANCASTER, N. Y.
CANADA: SAFETY SUPPLY CO., TORONTO — BRANCHES IN ALL PRINCIPAL CITIES
EXPORT: 15 WEST 57th STREET, NEW YORK 19, NEW YORK

HOME FIRE INSPECTIONS

Continued from page 904

be coached in the answers he is to make to inquiries from passersby who may not be content with the information contained on the explanatory placard which apparatus should mount (this last is considered essential by most fire chiefs).

Inspections are frequently made only on one side of the street during a single tour. When inspections start within a block, the custom is to complete the block survey on that tour.

Appropriate records should be made and retained by the department, covering each property visited, the conditions encountered, etc. Such information may constitute an excellent mailing list for further departmental promotions.

Quo vadis?

What of the future? It is filled with possibilities and opportunities, insofar as home inspections are concerned. Of the nation's 50 million dwellings, less than 4 million have had a single visit by firemen —except of course for the grim business of fire extinguishment and life saving. And new properties are being erected (wih new hazards) almost faster than they can be inspected.

Shortage of manpower for dwelling fire inspection has been at least partially overcome by judicious use of radio (which also has a long way to go before all the nation's fire departments will be radio-equipped).

Efforts to curtail public fire department budgets may prove a deterrent to this most important fire preventive innovation. But now the ice has been broken, apparatus or company dwelling inspections will most certainly increase in degree and effectiveness, as methods and procedures improve from experience.

An encouraging sign also, is the attention being given to stronger, broader laws governing fire safety. At least one state we are told, has a law permitting firemen to enter homes on inspections without invitation, notwithstanding the generally accepted law of "eminent domain." There will be interesting developments in this field as fire service organizations, safety groups and kindred bodies show more interest in the saving of lives —particularly those 4,000 youngsters— from deadly, destructive fire. □□

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Fireman Sues for $750,000

Walter J. Hauck, Rochester, N. Y., fireman who was critically injured fighting a fire July 3, 1953, has filed a Supreme Court action for $750,000 said to be the largest amount ever demanded involving injuries to one person in the history of Monroe County, N. Y.

Suit was brought against Domenic W. Roncome of Irondequoit, N. Y., who with Mary Spaccasi was the operator of the Speaker's Furniture Co. on State street, alleging that volatile and flammable substances were stored in the premises and the second floor windows boarded up, confining the flames and causing an explosion in the walls of the building.

Other defendants were: The Rochester Poster Co., owners of large advertising signs placed on the roof of the building, the weight of said signs being one of the causes of the collapse of the retaining walls; the Genessee Brewing Co. and the Kraft Food Co. of Rochester, the latter two firms had signs on the structure.

Hauck alleges permanent injuries and will never walk again or be able to use his limbs. For many months he was forced to lie in a crib face downward, his neck encased in a spinal brace.

His attorney is Edward M. Edenbaum, New York City, counsel for the International Association of Fire Fighters. Counsel reportedly said that the City of Rochester had already spent more than $70,000 in hospital costs for Hauck, who had more than 17 operations in Rochester and New York hospitals.

Hauck, 31, was on a ladder on the roof of the building at 532 State street when a wall collapsed pinning him under tons of debris. He had been a member of the Fire Bureau only five days when injured.

Hauck spent more than two years in a New York City hospital where he was visited at times by fellow firemen and others interested in his case. He presently is a wheel chair patient and is still receiving therapy treatments.

—*Tom McCarthy*

TRAFFIC CONTROL

Continued from page 915

impending change from normal operation and at the same time signals the emergency vehicle operator that the system is under control. After a few seconds of the flashing lights, all signals turn red in this system, as in the other. If two vehicles are approaching the same intersection, a separate flashing red light begins operation, warning both drivers to exercise caution.

Conclusions

The adaptation of any one of these electronic devices to the ever-growing and complex problem of traffic control promises to bring a new standard of safety to the fire service. In the past, all methods of approach have been from an inflexible central point operated by a dispatcher who had no visible means of judging the conditions. These new developments establish the control at the point where it can be most effectively applied, i.e., on the apparatus that must cross the intersection.

Many students of the problem of traffic control and its relation to fire department response, believe this on-the-spot control, perhaps coupled with the use of fire lanes, may provide the answer to these vexing problems.

Naturally, whatever system is adopted, education of the motoring and pedestrian public is a requisite. Obviously this will take time. However, with public spirited commercial vehicle operators, truckers and taxicab operators as key users of the streets, once convinced on the advantages of these improvements, they may well, in turn, serve as bellwethers for the motoring public.

There are of course, other details to be ironed out such as installation, upkeep and maintenance and the like. Another factor is cost. In view of the fact that the installations require practically no additional poles, pedestals or wiring, no digging of trenches and/or laying of conduit, and that supervision of the system is possible at all times, cost may not be as serious a factor as the progenitors of the systems at first feared. And as for maintenance, it is reported that this should be no more serious or costly than upkeep of the other forms of wired and wireless traffic controls. Time, of course, will tell the tale.

Already the initial installations are receiving acclaim, with due reservations for the brief period of experimentation which some of them have had.

In Maywood, Ill., the radio control installation reportedly has been in operation at a number of intersections for a number of months. This is said to be the first installation of its kind, and it has been demonstrated to officials of many municipalities.

In New Haven, Conn., Fire Chief Thomas Collins reporting to FIRE ENGINEERING, says that in his city the police department installs the receivers and the fire department places the transmitters. Questions not definitely settled are the

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exact distance that lights will operate with the apparatus, and some details of directional control.

Another city which has been experimenting with an electronic traffic control system is White Plains, N. Y. Fire Chief Edward MacDonald and Superintendent of Fire Communications Thomas Divine report their installation still in the experimental stage. In both this city and others, engineers of the manufacturers are cooperating with the fire communications personnel and police linemen on matters of installation and maintenance.

These and other progressive fire officials who see the possibilities in the driver-control of traffic signals are tackling the problem in the same spirit that has brought drastic improvements in the field of fire fighting. Chief Thomas Collins voices the sentiments of the cautious majority when he says, "I believe in all fairness, that the system should be given a year's field test before voicing any approval or disapproval of the installation."

As for the fire lane innovation, New York City fire officials, including Fire Commissioner Edward F. Cavanagh, Jr.; Fire Chief Edward Connors and Deputy Chief Thomas O'Brien, who heads the group at work on this project, all of whom have watched the pilot tryouts, are enthusiastic about it. More, much more, is destined to be heard about this development as the days pass. □□

Acknowledgment: The editors acknowledge the assistance of the following in the preparation of this report: The New Haven, Conn., Fire Department, Chief Thomas Collins; the New York Fire Department, Commissioner Edward F. Cavanagh, Jr., Chief Edward Connors and staff; the White Plains, N. Y., Fire Department, Chief Edward MacDonald; the Maywood, Ill., Fire Department, Chief Dave Smith (report to FIRE ENGINEERING, *March, 1955); the Columbia, S. C., Fire Department, Chief A. Mc. Marsh; and the following manufacturers: Eagle Signal Corp., Moline, Ill., Electronics Protection, Inc., Melrose Park, Ill. and the Genetal Electric Company.*

FIRE HOSE

Continued from page 932

to the butt with the present expansion rings. Another commented that some of the couplings they were using on older hoses would not fit all of the synthetic hose they were trying out.

Obviously, some of the comments advanced were based upon extenuating circumstances or unusual conditions not fully defined by the respondents, and a few might well be applied to any type or make of hose. All in all, there were surprisingly few serious objections raised, considering the breadth and scope of the inquiry.

On the matter of durability, only two chiefs questioned the wearing qualities. One large department stated, "We find it snags much easier than cotton hose." Another smaller department reported, "The weave breaks and weakens the hose." Considering the fact that the ques-

tion of durability was asked of chiefs of departments of every size, in every state in the nation, the lack of criticism on this score is enlightening.

Among the attributes of the synthetic fibre hose beyond those already listed, respondents included the following: "Hose is much easier to handle.". . . "Hosemen like it as working lines.". . . "Cleans easier.". . . "Easier for small crews to lead in and advance up stairs."

Life and care of hose

Perhaps the most important disclosures made by the survey were the lengths of service given by fire hose and the methods of caring for it.

The average service life of 1½-inch hose was reported to be between 5 and 10 years, although a large number reported that 10 to 15 years life was expected. In the 2½-inch and larger sizes, 10 to 15 years was the average, although 5 to 10 years was second. The shorter life of the smaller hose may be expected due to its greater usage.

Reports of the methods of drying hose indicated the rack drain was most frequently employed, but that this was not the preferred procedure. More than 50 per cent of the departments using this system stated a preference for other means. A few chiefs said they preferred to dry their hose on the floor of the fire station. Some indicated that while they would rather use another method, present facilities were lacking for a change.

Hose replacement policies differ very widely, the majority of respondents stating purchases were made as necessary to keep their hose stocks at a definite level. The next most popular procedure is a yearly budget item purchase and the replacement of a definite amount of old hose at such a time.

Of those departments which follow a replacement time schedule, ten years was given as the most accepted period. Replacement every eight years was next, although many departments replace theirs "as needed." Nearly all those reporting agreed that hose not meeting the department testing standards is immediately removed from service, and many add that if repairs cannot be made, the defective hose is replaced by new hose.

The procedures employed for testing new and old hose vary considerably. Seventy per cent of all departments test new 1½-inch and 2½-inch hose upon delivery. The most popular specification pressure for 2½-inch hose reported is 400 psi. Testing new 1½-inch hose is divided almost evenly between 200 and 400 psi, according to reports. The specifications for the test pressures however, vary widely from 100 to 600 psi; at least one department requires that all new hose stand 700 psi.

The test pressures which old hose is required to meet vary from 90 psi to 600 psi, but nearly 50 per cent of all departments answering the question test service hose at 200 psi. More than 50 per cent of the departments that use 3-inch or larger hose, test it at 200 psi. Annual tests were made by 50 per cent of all departments reporting, while semi-annual tests

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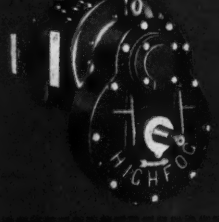

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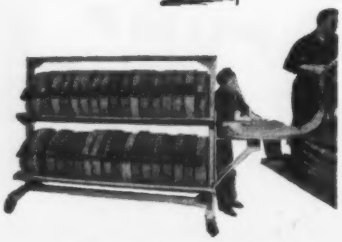

Since its introduction just a few months ago—Porto-Rak has been enthusiastically received. Saves valuable space. Holds 1800 ft. of 2½" hose —proportionately more of 1½"—in an 8 ft. space (when loading table is detached). Roll it right up to the truck for complete hose reload—out of the way when not in use. Equipped with locking fiber wheeled casters.

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NEW HOSE TEST DATA

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New 3-inch tested by 66% of departments

Test Pressures—psi	*1½-in.*	*2½-in.*	*3-in.*
150	6%	1%	—
200	22%	17%	18%
250	13%	16%	16%
300	11%	13%	14%
400	23%	28%	40%
600	2%	4%	5%

Note: *Only the six most popular test pressures reported here*

SERVICE HOSE TEST DATA

Hose in service tested by 91% of departments

Test—psi	*1½-inch*	*2½-inch*	*3-inch*
150	12%	4%	—1%
200	42%	44%	64%
250	19%	24%	22%
300	11%	13%	10%
400	2%	8%	2%

Note: *Only the five most popular test pressures reported here*

METHOD OF DRYING HOSE

	Tower	*Rack*	*Electric Dryer*	*Other*
Method Used	30%	40%	26%	4%
Method Preferred	47%	10%	40%	3%

were conducted by 25 per cent. Quarterly tests are popular with a number of respondents. A few chiefs report that all hose is tested either after every fire or at the 30-day hose change for apparatus, if the hose has not been used during that period of time. In making tests, 95 per cent of all departments use fire apparatus pumps in preference to any other method.

The answers to questions concerning spare hose stocks varied although the most frequent comment was "a spare change for every company in service." Many go further with the statement "complete replacement for every unit in service, plus sufficient extra to replace faulty lengths as needed."

Hose identification marks vary

Many methods are employed to mark hose for easy identification. More than a dozen systems were reported and perhaps as many more exist in the fire service. Stamping a coupling with the initials of the department appeared the most widely used; many add the date of purchase, plus the number of the length, for later service record purposes. In addition, many departments reported that couplings were also painted in various colors, some in combination with the stamped numbers, to identify individual companies in a department. Several unusual methods of identifying hose were reported, including the weaving of a special stripe in the jacket when the hose is manufactured. One department reported that a brass plate was soldered on the couplings of their hose for identification and the purchase date stenciled on jacket. □□

SALVAGE

Continued from page 953

method of folding. The one-man throw fold can also be effectively used by merely opening out the cover to the size desired. Some squads use the prepared floor chute, as outlined earlier in this chapter, for constructing ladder chutes, as by this practice it is only necessary to lay the chute on the ladder, unfold to the desired size, and then unroll the sides to fit the width of the ladder.

Dikes

To control the spread and direction of water flow many squads improvise dikes of one form or another from sawdust or salvage covers. Where considerable amounts of water are involved, sandbags may be pressed into service. It is difficult to predetermine the procedures that must be employed in this respect, because the circumstances of salvage operations vary widely with the construction of the building involved and the nature of the contents.

Generally speaking, if the building has concrete floors, sawdust alone will usually be sufficient for dikes. However, if a large amount of water is being directed to an opening it may be best to use salvage covers banked up on the edges with sawdust. This will prevent any washing away of the sawdust and possible breaching of the dike. Where wood floors are encountered it is generally customary to use the salvage covers as a trough with the edges banked up by laying the cover over dikes of sawdust.

To meet some situations a folded salvage cover may be used as a dam to prevent water from spreading through a doorway. The cover is jammed into the door opening at the floor and any seepage may be taken up by sawdust or by mopping. □□

Chicago Fire Houses to Be First Aid Stations

The 144 fire houses in Chicago will become emergency first aid stations if the Chicago Medical Society approves present plans. In disclosing the idea, Fire Commissioner Anthony J. Mullaney said that he hoped also to use the four insurance patrol quarters, the three fire boats, the drill school, the repair shop and his own office. Each would display the first aid sign and would be equipped with a special kit which has been developed by the department and the local Red Cross. Supervisor of Fire Department Ambulances Joseph J. McCarthy, a Marine Medal of Honor hero, is in charge of the project.

The new emergency first aid kit would be attached to the wall in each designated location. Weighing 47 pounds and equipped with handles, it can easily be removed and carried. It contains a collapsible stretcher, blanket, wire and wooden splints, tourniquet, forceps, compresses and gauze. All Chicago firemen are qualified first-aiders.

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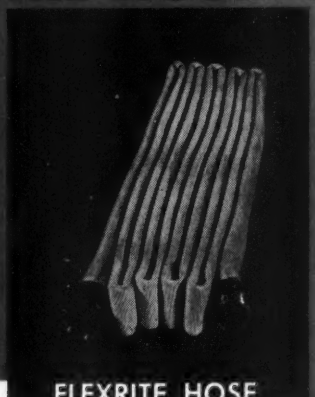

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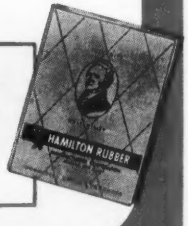

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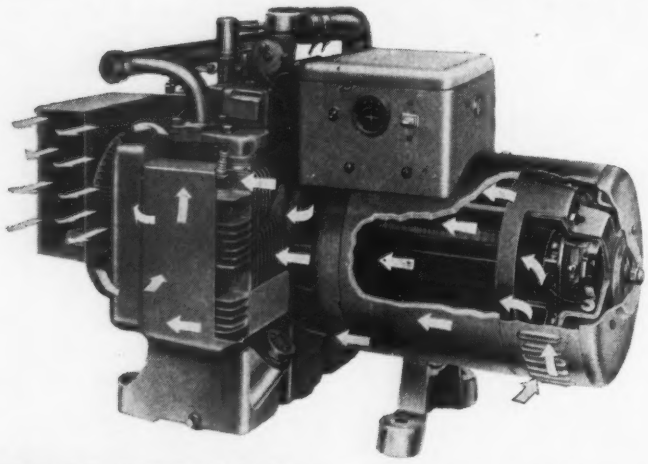

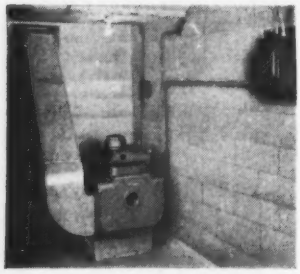

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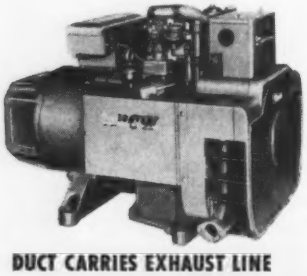

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CHEMISTRY OF CATALYSTS

Continued from page 912

small amount of inhibitor into fire streams, so that a minimum size fog stream would rapidly extinguish a fire and prevent flash back without subjecting the fire fighters to any danger.

4. A grenade-type device which could be thrown or fired into a burning building to bring the fire under almost immediate control. This bomb idea could be extended to use over forest and brush fires.

5. Use of selective catalysts to render harmless the gases produced by combustion, so that rescue, fire fighting, or salvage operations can be conducted in safety. A further application of this is where industrial gases or chemicals make fire fighting or industrial operations dangerous.

6. Use of small amounts of catalysts in ordinary air to prevent oxygen from combining with dangerous materials, which now require use of inert gas protection such as carbon dioxide.

7. A further extension of this idea so that the interior atmosphere in factories and plants conducting extremely hazardous processes (oil refineries, explosive, flammable chemicals) would be made inert as far as combustion is concerned, but will allow normal respiration by workers. Highly selective catalysts could be used.

8. The mandatory incorporation in each building of an automatic inhibitor which could be set in operation by high frequency radio waves transmitted from a central fire department communication center.

Conclusion

Some of the ideas set forth here are definitely within the scope of practical application. As a matter of fact, several devices making use of these facts are now on the market. For example, the Frigidaire Division of General Motors has just produced a new smokeless oven, which employs a special wire filter, heated to 650 degrees F. At this temperature it catalyzes the conversion of smoke into harmless amounts of carbon dioxide and water vapor. Another application is one type of combustible gas indicator, in which the oxidation of combustible hydrocarbon gases are catalyzed by a special wire unit, changing its resistance, and registering its concentration on a dial. Several years ago a sprinkler system using a special solution of catalytic chemicals was produced.

It must be pointed out again, that such applications of known scientific principles are entirely feasible and it is believed that someday enough knowledge concerning this mysterious and fascinating world of catalysts will be accumulated to solve each of the problems involved. Our hope for this lies in the open mind, the eager spirit, the insatiable curiosity, the pains-

taking scientific approach, of the young men in the fire service and the research laboratories of the future. In that day and age the fire service may move out of the fire stations and into the laboratory to take its rightful place beside the scientists. Its members may then serve the citizens primarily in the capacity of inspectors and investigators whose duty it will be to see that no outbreak of fire occurs.

Employed in this way, the future fire service engineer could well be described in the words of Dryden:

"Happy the man who, studying natures laws,
Through known effects can trace the secret cause."

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HIGH PRESSURE SYSTEMS

Continued from page 937

maximum was further reduced. During these years gasoline-driven pumpers, replacing the old steamers, were quartered throughout the high pressure areas. During the administration of Chief John J. McElligott, orders were issued to utilize the low pressure hydrants, at least for overhauling, to help reduce the costs of power to operate the pumps, and to relieve the distribution system of pressures higher than those which it normally maintained (75 psi).

As time passed and the costs of fire protection in all of its phases increased,

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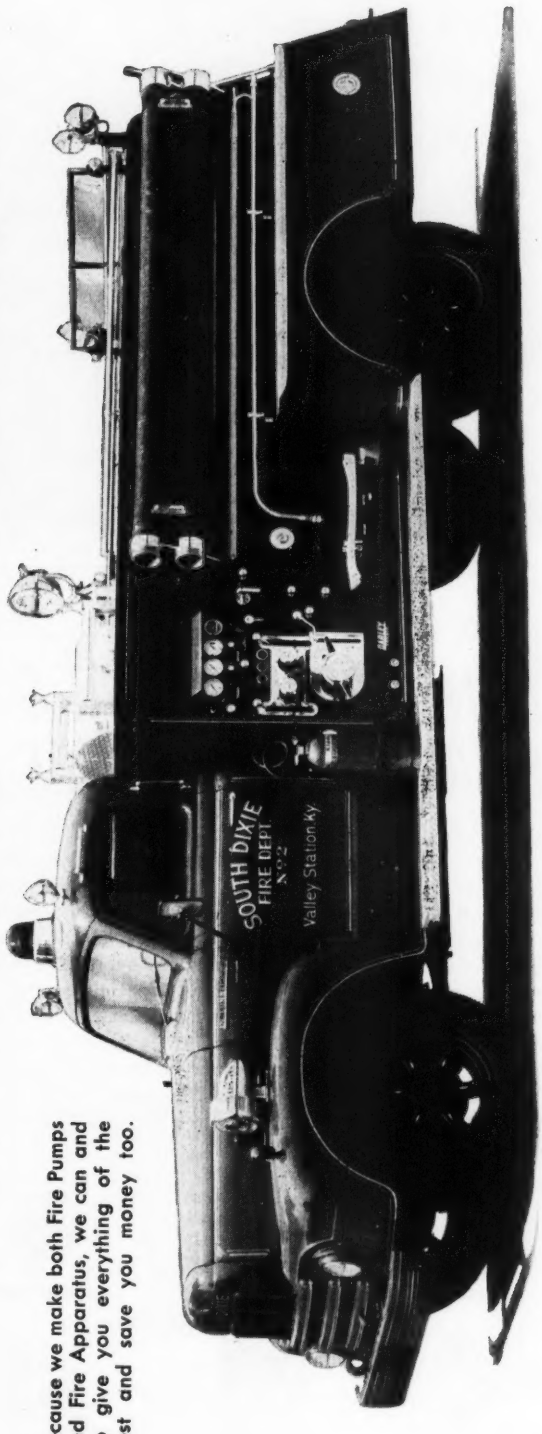

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the high pressure system came under increasing scrutiny. With expense to operate the four pumping stations a growing burden, and the prospect of diminishing efficiency becoming more real, fire officials raised the question of whether the system was any longer justified.

As a substitute it was suggested: Why not dispense with the high pressure pumping units and attendant maintenance costs, but utilize the distribution layout, as part of the low pressure domestic service?

To do this would mean strengthening the department's mobile pumping capacity which, many believed, would have to be done anyway. Fire department engineers were recommending 1,000 gpm pumpers for the city's high value areas and with these available to utilize the high pressure mains, and if necessary, the regular low pressure domestic distribution system, it was believed through them as much water could be delivered onto any fire in the areas as could be delivered by the old high pressure system. At the same time, the department would be providing more powerful mobile force for the protection of other areas, if required.

But sound as was the reasoning in most respects, the idea of eliminating the old system had its "Doubting Thomases." There was but one way to settle the problem, and that was to try it out.

CD test held

With an approving fire commisioner and capable department staff, this was done. In fact, the test went further than merely to determine the capabilities of the old distribution system operating with gravity pressure. It afforded an opportunity to school the department's auxiliary firemen and to enable the officers to acquire experience in Civil Defense procedures.

The tests also permitted the first large-scale use of the new Civil Defense pumpers which had been added to the department under the Federal matching funds program.

The trials got under way Sunday, June 14, 1953, and were carried out in three stages. In the first phase, 20 of the 750 gpm pumpers under the supervision of the then Chief of Department, Peter Loftus, were mobilized on the West side of Manhattan, between Tenth and Eleventh Avenues, and 15th and 21st Streets below Oliver Street Pumping Station.

For the purposes of this experiment, the Oliver and Gansevoort Pumping Stations were valved off from the high pressure mains, which were fed only by gravity pressure from Shafts 18 and 19 of the Catskill Water Tunnel No. 1. In general, the 20 pumpers were located two to a hydrant, similar to the accompanying diagram of Phase 3.

In the Phase 1 test the 20 CD pumpers simultaneously delivered 775 to 800 gpm each. The total discharge was 15,750 gpm. The lowest residual pressure on the mains, checked in the vicinity of Gansevoort Street, was 67 psi.

In Phase 2, 20 of the 750 gpm pumpers were located on the east side, Roosevelt

to Pine Streets and South to Water Streets. They delivered simultaneously 775 to 800 gpm, with a total discharge of 15,750 gpm. The lowest residual pressure on the mains in the vicinity of Oliver Street was 57 psi.

In Phase 3, 40 of the same type pumpers were also located on the east side, between Roosevelt and Pine Streets and South and Water Streets as diagrammed herein. These units delivered simultaneously 775 to 800 gpm with a total discharge of approximately 30,000 gpm. The lowest residual pressure during this test on the mains approximately 100 feet beyond the test location was 30 psi.

In each phase of the operations, two 3-inch hose lines were stretched from a high pressure hydrant to the rear suction inlet of each pumper, which were stationed at hydrants as indicated. All pumpers operated at 125 psi engine pressure in the capacity position with the relief valve locked out, discharging directly into the deck pipe fitted with a 1¾-inch tip. The deck pipes were operated at an angle of 60 degrees from the horizontal and streams were directed down the center of the streets to avoid damage to property.

Pitot readings on the deck-pipe nozzles revealed the discharges of 775 to 800 gpm at the 125 psi engine pressures. Fluctuations in engine pressures and incidental shutdowns to clean strainers, prevented an absolute figure being obtained by the supervising engineers for the maximum flow. However, it was established that with 40 pumpers operating as described (Phase 3), a maximum slightly in excess of 30,000 gpm was obtained.

Quoting from *W.N.Y.F.*, official magazine of the New York Fire Department, with all hydrants closed the Catskill water maintained 117 psi at the Oliver Street Station and 112 psi at the Gansevoort Street Station. At peak flow the lowest reading at the Oliver Station was 57 psi and in the Gansevoort Station it was 67 psi. Flows at the hydrants were as beforementioned.

These residual pressures at peak flow indicated that sufficient pressure remained in the mains to afford protection to other areas, or to supply greater volumes had the circumstances been different.

Simultaneous flow was assured by having one chief officer with 2-way mobile radio supervise each five pumpers under the over-all command of the chief of department, who directed his operations through the city-wide radio network.

The Manhattan Central Office dispatcher transmitted the high pressure breakdown signal 13-13 at 10:55 a.m. and it was not until 2:15 p.m. that he ordered the restoration signal 9-9-9 transmitted.

During those 3 hours and 20 minutes, radio enabled the chief of department and his aides to keep in constant touch with the Manhattan dispatcher, prepared to immediately cut in the high pressure pumping stations, should fire conditions so require.

Beginning in January 1952, flow tests were conducted on the Manhattan and the downtown Brooklyn high pressure

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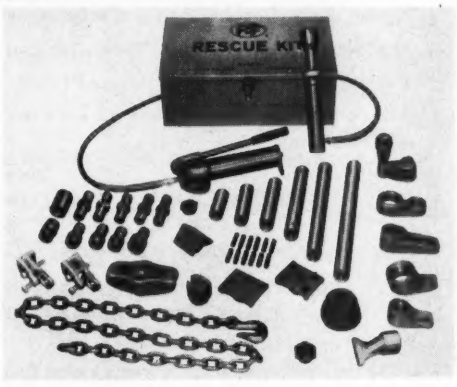

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FIREBOAT 2— 5 hrs., 46 min. pumping service
2,100,000 gals. water pumped on fire
200 gals. Diesel fuel consumed

FIREBOAT 3— 5 hrs., 44 min. pumping service
1,088,000 gals. water pumped on fire
200 gals. Diesel fuel consumed

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systems by New York's Department of Water Supply, Gas & Electricity to determine whether Catskill water, at gravity pressure, could match the fire fighting efficiency of Croton water at pumped pressures. These tests indicated that the high pressure mains, using Catskill head would provide sufficient water at feasible pressures to control fires at different points throughout the system with ample residual pressure in the mains.

Great saving to city

The elimination of the four high pressure pumping stations in Manhattan and Brooklyn, it is said, would result in capital savings of approximately $2 million, make available city properties valued at approximately $1 million, and cause reductions in operating costs of over $275,000 per year.

What the heads of department were primarily concerned with in weighing any change in the high pressure system protection, is fire safety in the same areas protected by that system. Huge daily populations, immense concentration of wealth, and extra heavy traffic and narrow streets, make first-rate fire protection imperative now, even more so than in the days of the horses.

Before the fire department would experiment with the Catskill gravity supply, several stipulations were laid down. These included:

1. The present piping system, including hydrant and control valves, should remain in its entirety throughout the high pressure system and should be maintained in first-class condition, completely purged of sediment, scale and foreign matter.

2. Two additional connections to Catskill Water Tunnel No. 1 at Shafts 20 and 21 should be made to supplement the two existing connections.

3. Every engine company in the high pressure district should have its manpower increased by one additional fireman per tour of duty.

4. All engine companies in the high pressure district should be equipped with first size pumpers.

Under these conditions, the New York Board of Fire Underwriters was informed of the proposed change and reported they had no objection to the proposed procedure. As was pointed out by fire department officials, when the high pressure system was put into operation in 1908, it was a tremendous improvement over the horse-drawn steamers of that time. However, conditions have since changed greatly in the city. Buildings are much taller, and the high pressure system can no longer supply water to the top floors of the higher structures. Today, the department has efficient, modern gasoline pumpers capable of developing pressures up to 600 psi on volume delivery.

Present 4-stage pumpers now in use in the high pressure areas are rated at 1,000 gpm at 160 psi; 500 gpm at 320 psi; 400

gpm at 400 psi and 250 gpm at 600 psi. They are perfectly capable of supplying an effective 2½-inch line at the maximum pressure.

There are at this writing 25 of the 1,000 gpm pumpers in Manhattan's old high pressure district. The performance of these pumpers at the Wanamaker fire was described in the August issue of FIRE ENGINEERING. These pumpers shortly will be augmented; the fire department's 1956-7 budget includes provisions for 32 additional 1,000-gpm pumpers. In addition, further pumping strength is being provided for the city's expanding fire department.

New York is not the only city that has either discontinued all or part of its high pressure system, or plans to do so. Detroit is another to weigh its high pressure layout and come up with the decision to shelve it. Future developments in this field of fire protection will be watched with keen interest by fire and water works officials throughout the nation. □□

The editors gratefully acknowledge the assistance of Fire Commissioner Edward F. Cavanagh Jr., Fire Chief Edward Connors, the Chief Supervising Engineer of the department Harry Irwin and his aides and Hon. Battalion Chief and Department Historian Clarence Meek for their assistance in providing the factual data upon which this account is based. Special appreciation is also extended to W.N.Y.F., official magazine of the New York Fire Department.

Connecticut Firemen Convene

Patrick M. Sherwin, a pumper engineer attached to Engine 1, Bridgeport, Conn., Fire Department, was unanimously elected president of the Connecticut State Firemen's Association at the 63rd Annual Conference in Naugatuck on August 17. Mr. Sherwin, who served as vice president of the association for the past year, succeeds Robert F. Probst of West Hartford.

Other officers elected at the meeting were: William J. Canty, Torrington, vice president; John Moehring, Stamford, secretary; Andrew J. Flanagan, New Haven, treasurer, who succeeds Charles H. Brundage of New Haven, who died suddenly on August 16, the day before the conference opened. The Reverend Michael J. Thompson of Niantic was renamed chaplain.

County vice presidents elected were: Hartford County—Chief Anthony Rosso, Kensington; Litchfield County — Chief John Gibb, Terryville; Tolland County —Chief Benito Muzio, Staffordville; New Haven County—Kenneth Cleary, Waterbury; New London County — Chief Thurston Howard, Waterford; Fairfield County—James A. McDermott, Danbury; Windham County—Albert Martin, Willimantic; Middlesex County — Chief J. Franklyn Dunn, Middletown.

More than 450 delegates from all parts of Connecticut attended the convention. Among the speakers were Mayor Charles

Continued on page 997

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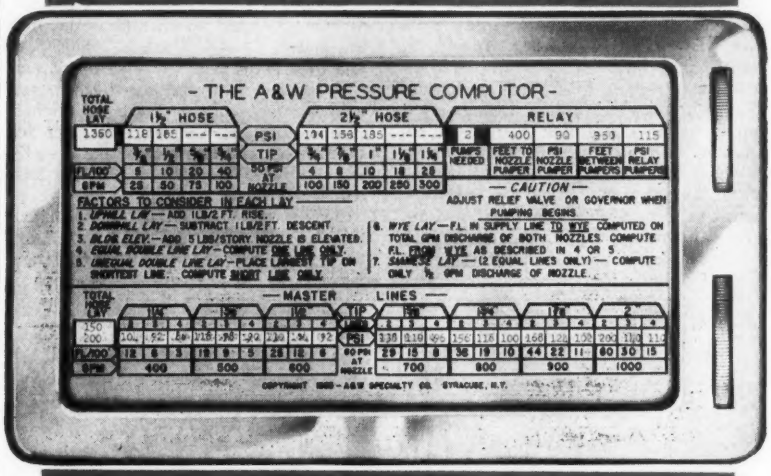
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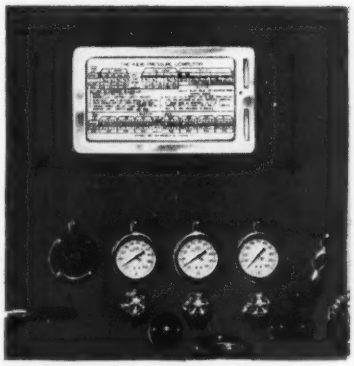

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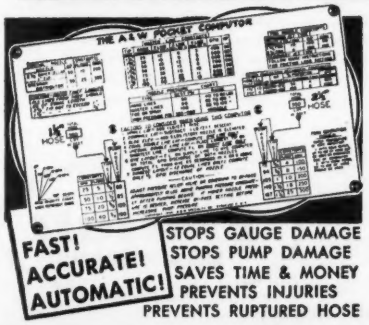

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Among the Buffs

By Paul C. Ditzel

NOT LONG AGO in Los Angeles a rather influential businessman arrived home one evening and found a citation against him for violating ordinances governing the condition of incinerators. The citation, written by a fireman who found the faulty incinerator during a house- to-house inspection tour, irked the businessman who, though he had been warned on several occasions, had slight understanding of the incinerator ordinance.

During his coffee break the next morning the businessman was griping about "fire department bureaucracy" to one of his associates who happened to be a buff. After hearing him out the buff explained the "why" of the ordinance and as soon as they returned to the office the buff telephoned Chief William L. Miller. Several hours later the fire department sent two inspectors to see the businessman who was not only impressed with their courtesy but also came to realize that his defective incinerator could have easily touched off a playhouse where his four children played.

By his one-man public relations act, this buff not only served as the liaison between the fire department and the public, but also won the department a good friend and moreover helped to check a potential fire which could have had tragic results.

We hear much these days about the profession of public relations which for years had erroneously been thought of by the public and industry alike as a Hollywood press agentry job good only for boot-licking men who "mixed well with other glad-handers."

Government, especially on the municipal and county levels has been slow to appreciate the value of good public relations, usually because of budget reasons. One of the most recent trends in our fire service has been the establishment of public relations bureaus which have exceeded the wishes of the most optimistic fire chiefs in the handful of departments that have such divisions.

This is where buffs can fill a noticeable gap between the public and their fire departments. Every genuine buff, whether or not he belongs to an organized club, is a one-man public relations bureau for his fire department. I've known many buffs whose sole claim to the hobby is what they consider their amazing ability to pop out of bed at 4 a.m. to race to a two-bagger. These are not always the genuine buffs.

The unadulterated article is as devoted to the *esprit de corps* of his home department as the firemen are themselves. He is as interested in the fascinating science of fire prevention as he is in the machinations of the alarm telegraph. He is just as interested in seeing that his community has the best possible apparatus obtainable and the best firemen they can get at commensurate pay. And as a civic leader with a specialist's interest in fire protection, he is anxious to back legislation which will help his department protect the community.

My experience, like that of every other fire buff I'm sure, has been one requiring great patience and diplomacy in explaining such a hobby which the uninformed are quick to label "firebug." If you've been able to weather it for as long as I have and can still smile when you say you're a buff, then you know that good buffing penetrates deeper than a cup of coffee served to a fireman from a canteen when the mercury dips below zero, worthy as that sort of work undoubtedly is.

Through my mailbox flows the best cross-section of buffing activities in the United States. Separating the wheat from the chaff, I often wonder if buffs themselves, much less chiefs and firemen, have ever paused to calculate the tremendous potential of this volunteer army of public relations men.

Buffs, historically perhaps, started out with an acute case of foot-in-mouth disease when they became entwined in fire department politics. It's an ailment many clubs and individual buffs have never been able to live down. When you have such a hobby with profound political overtones it's often difficult to divorce personal opinion from independent observation of a department's workings. The genuine buff, like a good fireman, knows when to back away from a hot one.

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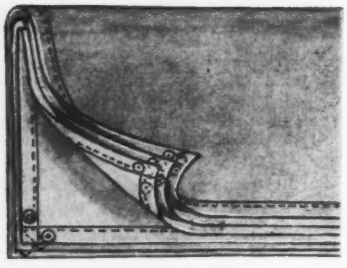

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There are many other facets of good buffing by those of you who are firemen at heart. And it's gratifying to see how buffing so easily leads into other worthy projects. This column has for years noted them as I've heard of these programs. Just the other day I learned that Bill Goodman of Baltimore's Box 414 Association, is Maryland State Chairman of the Multiple Sclerosis Drive. Club members have placed 1000 coin canisters throughout Baltimore. Such civic work multiplies friends for the clubs themselves and also reflects glory upon the fire departments whose exploits they follow.

You don't have to be a club member to build good relations, either. Take Don Kimball of 4806 Berwyn Road, College Park, Maryland, for instance. He read of a European fire chief I befriended while I was there and for some time has traded fire information with him to the mutual benefit of both their brigade and Kimball's home department.

The list of things we might do to help our fire departments is longer than anything we could put in one column. Both Roi B. Woolley, editor of this magazine, and I would like to hear from you buffs who have additional ideas on the subject. Through this clearing house we will be happy to make such constructive information available to all of FIRE ENGINEERING's readers.

Send your suggestions to me at 419 Napoleon St., Playa del Rey, Calif. This column is and always will be an open forum and I'd be especially interested to hear from fire chiefs or firemen who have constructive criticisms to make, even though you might wish to remain anonymous in the column. □□

Continued from page 995

F. Clark of Naugatuck; U. S. Representative James D. Patterson; Mayor Edward D. Bergin of Waterbury and Leo Mulcahy, State Civil Defense Director.

Among the important resolutions passed at the convention were:

The Association to join the United Firefighters Association of Connecticut on working for the establishment of a $6,000 minimum yearly wage for all paid fire fighters of three years' satisfactory service with a municipal fire department.

The passage of a political rights bill for firemen at the next session of the State Legislature.

The passage of legislation providing a penalty for the failure of a person to permit another person to use a party telephone line to report a fire.

During his talk to the delegates, State Civil Defense Director Mulcahy said that he will make "every attempt to get the Federal Civil Defense Administration to change its present matching funds policy on fire equipment." At present there is no provision for fire equipment, he said. Director Mulcahy also asked the association to consider his request for another civil defense rescue training school in Connecticut, to be located in the western section of the state. One already is planned for eastern Connecticut. —*Tom Magner*

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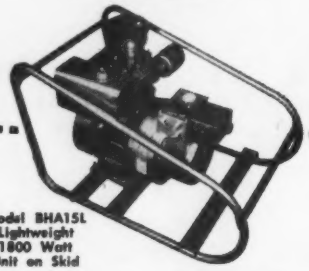

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Curbing the Inquisitive Spectator at Fires and Other Emergencies

FEW FIRE CHIEFS have not had to face the problem of coping with crowds of inquisitive spectators at fires and other emergencies. In many cases, serious interference with the operation of the fire department has resulted from these crowds. Later-called companies have been badly delayed in getting to the fire as a result of traffic jams around the fire area. Even during an emergency, the fire department has had to give consideration to public safety and has often had to sacrifice precious moments to prevent injury to bystanders.

The broadcasting and televising of fires and other emergencies has tended to increase the number of sight-seers, and even though the cooperation of the broadcasting stations has been asked, and given in the effort to induce the public to stay away from the fire scene, in some cases the publicity has only helped to stimulate their curiosity.

Many chiefs responding to this discussion have suggested that radio and television stations delay their broadcasts or telecasts until fire apparatus and additional help have had a chance to reach the scene of the emergency and get located. In some cases the broadcast stations make a tape recording or film of the fire and show it on their news broadcasts later in the day. Whenever the cooperation of the news media has been requested, it has been forthcoming.

Fire departments have had to depend in the main for traffic control upon the cooperation of the local police. The chiefs reporting are unanimous in their praise of the police in setting up fire lines and in holding back the crowds of spectators. Some who participated in this round table feel that well-policed spectators create good public relations and take home with them a lesson in fire prevention.

Readers are invited to join in this discussion which will be continued in the November issue. Address replies to Round Table Editor, FIRE ENGINEERING, 305 East 45th Street, New York 17, N. Y.

THIS MONTH'S QUESTIONS

Do you find the crowds of inquisitive spectators at fires or other emergencies on the increase? If so, how seriously does this interfere with your fire department operations?

Do you find the public broadcasting and/or televising of fires or other emergencies increase the size of spectator crowds?

Have you taken any action to enlist the aid of radio and/or TV stations to discourage crowd congregation and interference?

What steps would you recommend to curb these crowds of curious sightseers?

Discussion of the Question

F. C. MacGillivray, Chief, Halifax, N. S.: We find that the crowds of inquisitive spectators at fires and other emergencies are on the increase, but we have had few occasions of any serious interference with fire department operations. The police in our city are very cooperative.

Generally speaking, the broadcast of multiple alarm fires has increased the size of the crowd.

This is a serious and difficult problem as radio and television stations have access to this news from sources other than the fire department, such as teletype recorders, etc. However, we in Halifax have concentrated on very close fire-police cooperation at fires as a means of gaining quick control over crowds. To further this plan, I address the annual sessions of the Maritime Police Chiefs and Chief Officers, at which time I point up the necessary police action required at the scene of a fire. While this does not provide a complete answer to the problem, nevertheless it has produced fast, efficient action on the part of police in gaining and keeping control of crowds at fires.

J. C. Wilkerson, Chief, Augusta, Ga.: I will have to confine my comments strictly to the fire department operations. There is possibly some increase in crowds at fires that cause interference on second and third help calls, which may delay these companies from laying lines or getting their ladders placed properly.

To some extent, the broadcasting or televising of fires does increase the size of the crowd. Unfortunately, the average

radio announcer knows very little about fire fighting and tends to exaggerate or dramatize what he sees, rather than what he knows about what he sees.

I have talked to some announcers about this, and it has had very favorable results.

I would appeal to television and radio stations and also to local newspapers, to discourage crowds of curious sight-seers at fires and point out the dangers of interfering with fire department operations; also danger to spectators from falling walls, explosions, etc.

J. H. Freeman, Chief, Tucson, Ariz.: At times, crowds interfere seriously with the operations of the fire department at fires and other emergencies.

The broadcasting and televising of fires does increase the size of these crowds.

We have asked the radio and television stations for help in curbing these crowds, and they have been most cooperative.

It is necessary to avoid publicity at time of fires and to ask the police department for more officers at the scene.

Jay V. Redmond, Chief, Lakewood, Ohio: I believe the number of spectators has increased, due to the number of cars on the streets that get into the fire zone before police arrive. I also believe well-policed spectators create good public relations and take home a lesson in fire prevention.

We block both ends of side streets with police cars, as well as the intersections on each side of the fire on thoroughfares and keep spectators a safe distance from harm.

V. A. Parker, Chief, Cumberland, Md.: We find crowds of inquisitive spectators on the increase, but by close cooperation with the police department, interference other than traffic at the start of fire or emergency is definitely on the decrease.

We have found that the broadcasting or televising of fires has increased the size of crowds. We do not allow them beyond fire lines.

We have appealed to the general public to stay off streets and away from the immediate vicinity of the fire ground.

To curb these crowds, I would recommend the following:

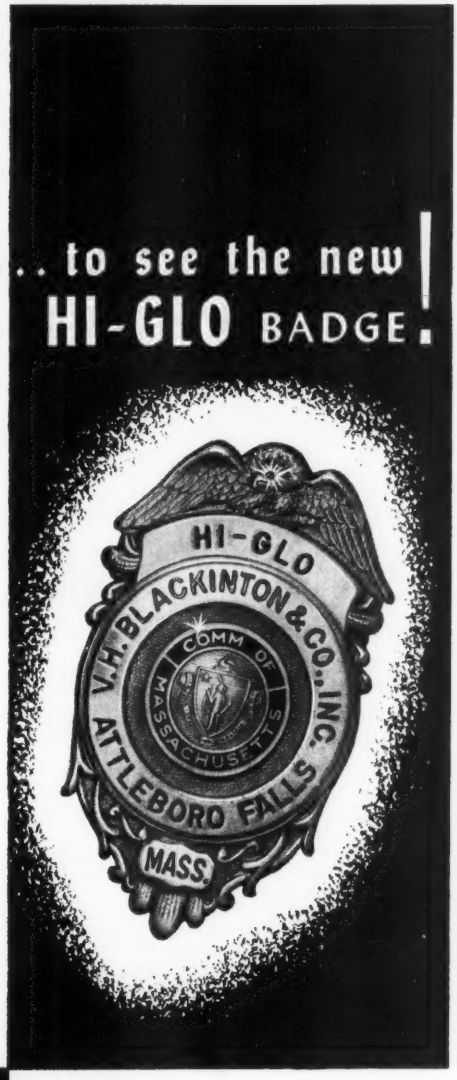
1. Close cooperation between police and fire departments
2. Rerouting traffic
3. Setting up fire ground boundaries
4. Appealing to radio and TV stations to ask the general public to stay away from the fire

C. S. Canady, Chief, High Point, N. C.: Crowds of inquisitive spectators at fires are definitely on the increase. The spectators are usually dispersed by the prompt and efficient work of our police. Spectators do not seriously interfere with our operations. What we are more concerned with is vehicular interference.

Public broadcasting and televising of fires and other emergencies do increase spectator crowds to some extent.

We have the cooperation of local radio and TV stations in discouraging crowd congregation and interference. We also

don't forget.....to see the new HI-GLO BADGE!



HI-GLO

The badge you can polish, polish, polish. It will never lose its golden color. Ruby colored stone set in the eye of the eagle.

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Miami, Florida—Nov. 12th to 15th

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Attleboro Falls, Massachusetts

use our daily radio program to discourage spectators from interfering with our operations.

I would recommend a public relations program, public education and rigid law enforcement as steps to curb these crowds of curious sight-seers.

Jesse G. Hunter, Chief, Cedar Rapids, Ia.: Spectators seem to be on the increase. Several times in the past few years they have hampered companies responding on second alarms.

Public broadcasting and televising of fires does increase the size of crowds at the fire scene. Everyone likes to see things firsthand.

No action has been taken with the news media to discourage crowds.

Strict enforcement of the laws regarding following fire apparatus and blocking streets to let the fire apparatus move as freely as possible is necessary to curb these crowds of spectators at fires.

The following replies are in answer to a previous question on fire apparatus accidents.

Charles Decker, Chief, Lansing, Mich.: We have no cab-over-engine type apparatus. We prefer enclosed cabs and have had no injuries since these improved companies have been put into service. The men ride in the cab to and from alarms.

Previously we had minor injuries to members riding the rear or side of apparatus.

J. P. Caldwell, Chief, North Little Rock, Ark.: Our records for the past 15 years show only one accident to personnel and that was caused by carelessness on the part of the fireman riding the side of apparatus instead of in the cab.

There is more chance of accident, in our opinion, with men riding the rear or side of apparatus than in the closed cab. At times the men aren't given time to be properly clothed, and therefore, are insecure until such time as coats, helmets, etc., are donned. We feel closed cabs are much safer.

Once a driver has become accustomed to his apparatus, visibility, spotting, distance gauging, etc., becomes automatic.

C. M. Deal, Chief, Lakeland, Fla.: The only cab-equipped apparatus we have is for chauffeur and officer.

We have no record of injuries to men responding to or from fires. I don't believe we have had any injuries in the 17 years I have been with the department. The only accidents have been minor ones.

Harold H. Dean, Chief, Phoenix, Ariz.: We have no apparatus with enclosed cab for members and chauffeurs.

Personnel injury frequency is greater when members ride side running board or rear step than when they ride inside body of apparatus.

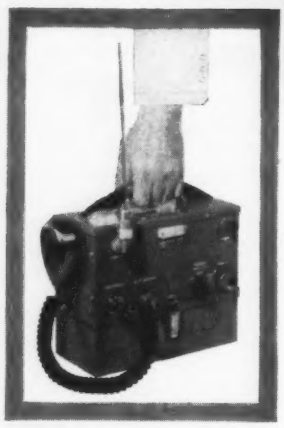
We have had no accidents with cab-over-engine apparatus. Officers and chaffeurs of this apparatus claim better visibility (traffic-wise) and no operational difficulties.

Announcing the Model H/M

PAK-FONE

2-WAY RADIO

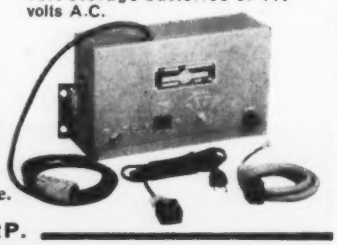
- HAND-CARRIED. EXTREMELY COMPACT.
- BUILT-IN LOUD SPEAKER. CONVENIENT MONITORING.
- RELAY SQUELCH. SILENCE BETWEEN CALLS.
- CONNECTOR FOR POWER SUPPLY. SAVES BATTERIES.
- WITH UPC-100, OPERATES FROM 6, 12, 24 VDC AND 117 VAC.
- ON-OFF INDICATOR LIGHT. AVOIDS RUN-DOWN BATTERIES.
- TOP PERFORMER IN ALL COMPETITIVE TESTS.
- A HEIMARK DESIGN. FCC AND FCDA DESIGNATIONS.



The Model H/M Pak-Fone is being widely accepted by Police and Fire Departments because it does not require holding a handset to the ear. Also, the annoying "rushing" characteristic of other hand carried portables on standby is eliminated by the use of a relay squelch.

Industrial Radio Universal Power Converter UPC-100

New power supply operates Pak-Fone and other portable 2-way radio equipment from 6, 12, and 24 volt storage batteries or 117 volts A.C.



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MODEL 6600 PUMPER—Instantly Self-Priming—No waiting when seconds count

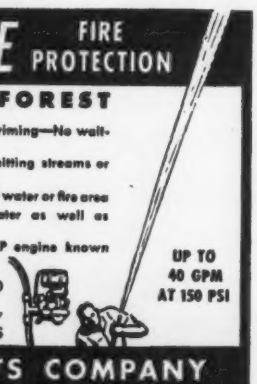
HIGH PRESSURE—Use one or two hard-hitting streams or fire-blanketing fog-spray

LIGHT WEIGHT—Easily carried to source of water or fire area

NEOPRENE IMPELLERS—Pump dirty water as well as clean water—assure long life

POWER—Efficient 4-cycle, air-cooled 5 HP engine known and serviced world-wide

BY-PASS VALVE, SPRING LOADED GREASE CUP, NO LOSS OF PRIME, PLUS MANY OTHER FEATURES



UP TO 40 GPM AT 150 PSI

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MANUFACTURERS' NEWS

Continued from page 972

manual or electric operation. The Electro-Matic pumps on the touring engines are custom-engineered specifically for FWD's fire engine chassis by the Waterous Company.

Demonstrations may be arranged for fire departments by writing to the Fire Apparatus Division, Four Wheel Drive Auto Company, Clintonville, Wis.

Mack Acquires C. D. Beck

Mack Trucks, Inc. has announced the acquisition of the C. D. Beck & Co., Inc., builders of intercity buses and Ahrens-Fox fire apparatus.

P. O. Peterson, Mack president, says production will begin on intercity buses immediately through the facilities of the Beck firm, located at Sidney, Ohio. Mack previously has confined its bus manufacturing to local transit-type buses.

The Beck company will be operated as a division of Mack Trucks, Inc. H. R. Fouss, present general manager of the Beck company, will head the new division.

Hydraulically-Operated Rescue Tools

Releasing victims trapped in wrecked vehicles, under debris, or in burning buildings, is frequently the unpleasant task of fire fighters and fire rescue squads. To speed such emergency operations with safety to rescuers, a complete line of hydraulically-operated rescue equipment has been introduced by Blackhawk Mfg. Co., Milwaukee, Wis., under the name "Porto-Power Rescue Equipment."

The highly compact but powerful equipment performs an unlimited variety of rescue operations so often necessitated in fires, storms, floods, vehicle and plane crashes, train wrecks, etc.

The products come in kits which include hand-operated pump and a ram, joined by flexible hose to permit remote control of the ram. This latter is an important feature when rescue work must be performed in hazardous areas or cramped quarters. Kits also contain se-

BEST SOLUTION TO YOUR HOSE STORAGE PROBLEMS

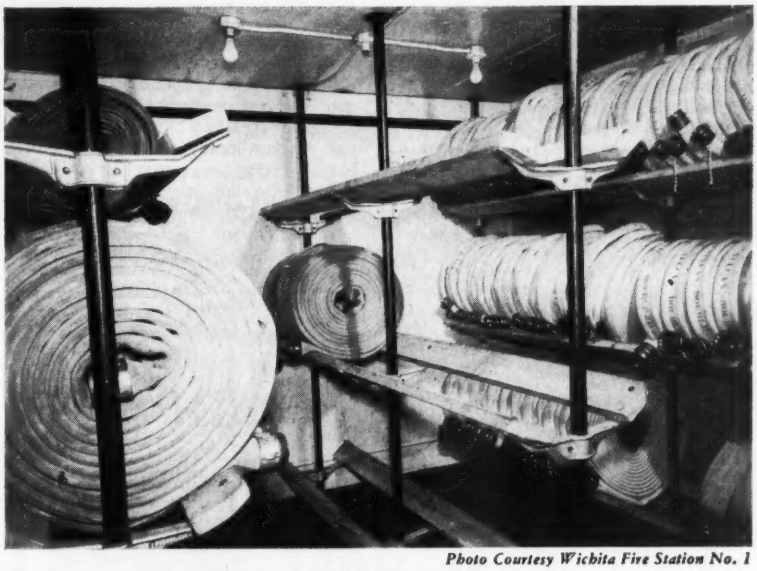
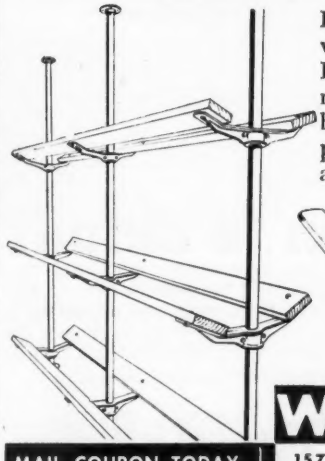


Photo Courtesy Wichita Fire Station No. 1

BUILD YOUR OWN RACKS WITH LOK-TITE BRACKETS

SIMPLE INSTALLATION	EASY ADJUSTMENT	BIG LOAD SUPPORT
Ceiling Flange; 1½" pipe supports LOK-TITE BRACKETS; Floor Flange	2 x 6 stringers bolt to the bracket; LOK-TITE BRACKET bolts to pipe support at any height	Pipe and stringers will fail before the brackets slip



Protect your hose with ample ventilation. Provide quick, easy access for use and inspection. Promote good housekeeping and make the most of your storage space, by planning and building your own racks – from new or used pipe and lumber, and handy, sturdy, fully adjustable Lok-Tite brackets.

Lightweight, high-strength aluminum alloy Lok-Tite brackets – designed for easy installation.

$3.65 F.O.B. WICHITA

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lected attachments which thread onto the ram to harness it for lifting, pushing, pulling, spreading, clamping and pressing.

Four basic kits are offered in 4-, 10- and 20-ton "power packages"; other hydraulic tools are available up to 100 tons. Each type is designed for a specific range of rescue tasks. None requires an outside source of power.

Combinations of jack and attachments can be built up on the spot to push, pull or spread with tons of force over any span, at any angle. Victims have been liberated promptly without hazardous torch-cutting, prying or hacking.

A new 12-page combination catalog and manual, HR-300, pictures and describes applications and assemblies. For your copy, address Blackhawk Mfg. Co., 5325 W. Rogers Street, Milwaukee 46, Wis.

MSA Research—a New Subsidiary

Mine Safety Appliance Company has formed a new, wholly-owned subsidiary, MSA Research Corporation, to consolidate and expand programs of basic research in the field of chemistry, physics and nuclear energy, as well as to handle basic research projects for the parent firm and MSA's domestic and overseas subsidiary and affiliated companies.

John T. Ryan, Jr., president of the parent company, heads the new corporation. Edgar G. Sanner, MSA vice president and manager of manufacturing, is executive vice president. Dr. C. B. Jackson, research director at MSA's Callery, Pa., plant and the Callery Chemical Co., a subsidiary, is vice president and director of research.

Although fundamental research now will be integrated in the new firm, the parent organization and each of the subsidiaries and affiliates will continue their respective programs of applied research and development, it is announced.

New Hannay Reel Catalog

Design and manufacture of hose reels for every use are pictured and described in a new colorful 20-page catalog of Clifford B. Hannay & Son, Inc., Westerlo, New York.

Prepared as an aid in selecting the hose reels to meet the specific requirements of any user, the catalog also describes standard types, as well as custom designs built to military and special specifications.

In addition to this newest general catalog, individual publications are available which give detailed information on hose reels used as for fire fighting, fuel delivery, industrial applications, aviation refueling, etc.

For the desired literature, address Clifford B. Hannay & Son, Inc., 174 Maple Street, Westerlo, New York.

Ansul Introduces New Automatic Piped Fire System

A compact low-cost automatic dry chemical fire extinguishing system for flammable liquid, electrical and textile fire hazards has been developed by Ansul Chemical Company, of Marinette, Wis.

The 30-pound piped system (PS-30) can be operated either automatically or manually. It is intended primarily for protection of moderately-sized hazards, in a wide range of installations.

The unit is installed near the hazard and serves as a storage tank for the dry chemical. A special CO_2 gas pressure cartridge expels the dry chemical onto the fire through piping connecting the dry chemical unit with the hazard area. The system can provide total flooding or local application. Special nozzles are provided for each type of application. Accessory equipment such as remote manual pull stations and devices for ringing alarm bells, shutting down motors, closing windows and doors, etc., is available. A special mounting bracket is also provided. The system can be recharged on the spot and put back into service immediately after a fire.

New Interior Alarm System

The Gamewell Co., Newton Upper Falls, 64, Mass., has announced a new interior fire alarm system that is adaptable for local evacuation alarms only, or for connection to municipal and/or industrial fire departments via existing city circuits or leased wires.

Termed "Flexalarm" by the manufac-

Emergency Apparatus

Custom Designed and Engineered to Your Exact Specifications...

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Baldwin, New York *Fire Department depends on this fully-equipped Approved Senior Model Emergency-Rescue-Disaster apparatus to handle any tough job easily. 28,000 pound vehicle features 225 hp. engine.*

ALL THE QUALITY FEATURES...

+ full attention to details

Only this strict attention to every single detail can produce the superior quality and reserve performance built into every piece of APPROVED fire fighting equipment. Inside and out, you'll find the same careful workmanship — *it's top quality through and through!* For efficiency and dependability nothing on the road beats APPROVED fire apparatus. Write or call us today to estimate your requirements without obligation.

A few choice territories still open for representation. Write or call Approved today.

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We invite your inquiries. Write for free literature giving apparatus specifications.

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PUMPER APPARATUS • EMERGENCY-RESCUE-DISASTER APPARATUS • AERIAL LADDERS
SQUAD & SALVAGE AND TANK TRUCKS • FLOODLIGHT APPARATUS • AIRPORT CRASH TRUCKS

turer, it is designed to provide economy without sacrifice of quality and to give an unlimited range of control equipment for large or small properties.

The new system consists of 26 UL listed components which can be utilized to make up any separate system to meet the needs of the purchaser. Expansion of the system can be accomplished at a later date without replacing the initial system.

Progress of Technical Committee, FAM, Reviewed

The Fire Apparatus Manufacturers Association held the first formal meeting of its Technical Committee on September 24, 1952, in Cleveland. Since that time, the committee has met twice a year with engineering representatives of each member company invited to attend. G. R. Layden, Chief Engineer, Peter Pirsch & Sons Co., is chairman of the committee, and D. F. Thomas of the Waterous Company is vice chairman.

The purposes of this committee are:

1. To promote sound engineering practices in fire apparatus design
2. To solve technical problems in the fire fighting field.
3. To provide a source of technical information to all agencies interested in the advancement and well-being of the fire apparatus industry.
4. To promote a better understanding of the use of fire apparatus equipment.
5. To encourage greater safety by suggesting testing and checking procedures designed to prevent accidents before they happen.

Sub-committees study the problems of pumping equipment, aerial ladders and general chassis design with respect to the fire service.

The Technical Committee has worked in close harmony with the Committee on Fire Department Equipment of the National Fire Protection Association. This NFPA committee is responsible for writing Bulletin 19, which forms the suggested specifications of the National Board of Fire Underwriters and the International Association of Fire Chiefs, as well as the NFPA.

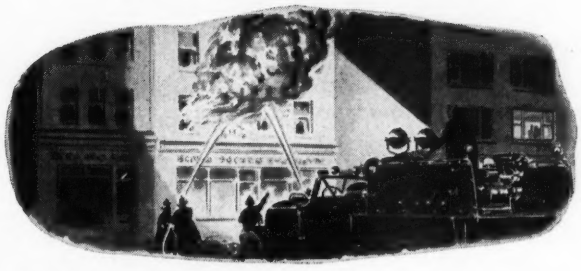
It has offered its services to the NBFU and various rating bureaus and has worked with these agencies on a number of occasions.

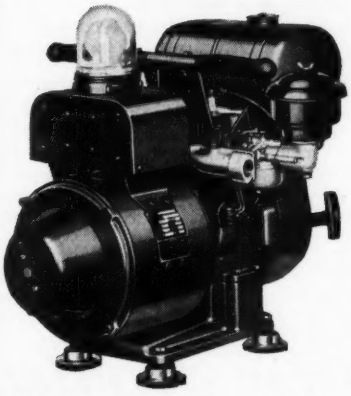
Among the outstanding accomplishments of the Technical Committee are the writing of aerial ladder test procedures and data published in NFPA bulletin 193-T; assistance given in preparing the booklet on "Fire Department Equipment" covering the manufacture, selection, care and testing of ladders as published by Oklahoma A. and M. College; the development of recommended pumper test procedures and calculation of practical lift charts for use on such testing; assistance given in developing a glossary of terms, and continuing work with the various NFPA committees.

The Committee invites the International Association of Fire Chiefs and the various bodies associated with fire fighting and fire apparatus to refer any technical problems to it for full consideration.

KOHLER Electric Plants

...independent electricity for municipal and volunteer fire departments





MODEL 1.5M25, *1500 watts, 115 volt AC. Manual starting. 2500 watt AC portable models also available.*

Portable 1500 watt Kohler model provides reliable power for floodlighting night fires—and for smoke eradication, power tools, resuscitators, pumpers, rescue equipment. Compact design, has 4 receptacles, pilot light, double carrying handle. Rubber-tired hand cart available. Other sizes, from 500 watts to 35 KW, include stand-by models for sirens, alarm signals, communications, when central station power is cut off.

Civil defense units use Kohler automatic stand-by electric plants to safeguard lighting and communications at headquarters, shelters, first aid stations, hospitals; portable models for rescue trucks. Write for folder N-9.

Kohler Co., Kohler, Wisconsin. Established 1873

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FOL-DA-TANK DOUBLES THE USE OF YOUR TANKER!

Acclaimed by Fire Departments Everywhere As The Answer to Adequate Water Supply!

Unloaded from fire truck or tanker and set up in less than 1 minute.

Two men easily open Fol-Da-Tank. Tanker or Mutual Aid trucks fill tank.

While pumper drafts from Fol-Da-Tank, tanker is free to bring additional water.

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You, too, can save the cost of an extra tanker and still give the protection of 2 tankers! In rural areas where the nearest water supply is often miles from the fire the Fol-Da-Tank often makes the difference between extinguishing the fire and the loss of thousands of dollars in property damage.

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Questions and Answers

wherein are answered questions relating to current problems in the fire protection

Fire Frequency

To the Editor:

I have noted that in applying safety engineering principles to the study of fire experience, mention is made of "fire frequency." Can you tell me to what this refers?

Answer: By fire frequency is meant the number of fires per 1,000 population per one calendar year.

For example, there are 175 fires in a city of 25,000, then

$$\text{Frequency} = \frac{175 \times 1{,}000}{25{,}000} = 7$$

If there are 175 fires in a town of 2,500, then

$$\text{Frequency} = \frac{175 \times 1{,}000}{2{,}500} = 70$$

It will be noted, two communities of different population having the same number of fires would have different frequencies. The frequency now determines how frequently fires occur per 1,000 population, and is an indication of the potential fire hazards in the community. Better fire prevention and protection, naturally, will reduce the fire frequency. Thus any change in frequency should serve a fire department as an index for fire prevention and loss reduction operations.

Hose Jackets

To the Editor:

We've carried hose jackets on our rigs for many years but only recently did we have occasion to use one. Can you, or your readers, give us any tips on how to apply a clamp type hose jacket (believe that's about the only kind on the market)?

Answer: We'll confess we haven't had this question come up before. Nor do we find any specific instructions on the application of a hose jacket in the manuals and literature we have researched, other than the general directions supplied by the manufacturer.

We quote the answer supplied by a veteran fire fighter. He advises to first turn the break in the hose away from you at an angle that will let you slide the bottom part of the open hose jacket under the hose line, with the water just over the edge of the jacket. Then bring the top over and down smartly. Most likely you won't be able to lock it by hand. When you've got the top over, slam your foot down on the jacket and it should lock.

He also cautioned against drying out of the rubber gaskets and also believes most fire departments don't give enough thought to inspecting this detail of their hose jackets.

Origin of Tarpaulin

To the Editor:

In many cities salvage covers are referred to as tarpaulins. I realize that the term is a common one, but I have been unable to learn just how it received its name in connection with salvage covers.

W. B. R.

Answer: History records that the first salvage covers were made of canvas treated with tar. Therefore the name "tarpaulin."

Solving for Volume of a Cylindrical Tank

To the Editor:

How do you find the volume of a cylindrical tank 12 heet high and 44 inches in diameter?

N. V.

Answer: First we find the cross-sectional area of the tank. The diameter is

You Are Invited . . .

TO VISIT BOOTH 31

HALL-SCOTT invites you to visit Booth 31 at the International Association of Fire Chiefs Conference in Miami, Florida, on November 12, 13, 14, and 15.

Features in Booth 31 will be the HALL-SCOTT Model 590-GV-4 and 6156-G-1 Fire Truck Engines . . . the most powerful and dependable power plants in their class.

On hand to greet you with answers to your questions will be AL BAXTER, General Sales Manager, and CONNIE WILLIAMS, Houston Branch Manager.

Booth 31 is a "Must See" on your list for the Conference.

Hall-Scott, Incorporated

BERKELEY, CALIFORNIA

HALL-SCOTT POWER

44 inches. The area of a circle is equal to the circumference multiplied by ½ the radius. The circumference is equal to 3.1416 × 44, or 138.23 inches.

The radius is 22 inches. Therefore the cross-sectional area of the tank will be 11 × 138.23, or 1,520.53 square inches.

The length of the tank, 12 feet, equals 12 × 12, or 144 inches.

Volume of the tank is equal to cross-sectional area multiplied by the length, or 1,520.53 × 144, or 218,956.32 cubic inches.

There are 231 cubic inches in a gallon. Therefore the contents of the tank in gallons will be 218,956.32 ÷ 231, or 948 gallons approximately.

Buff Nomenclature

To the Editor:

I have heard many times that the term "buff" originated in the days when the fire chasers used to see to covering the fire horses with buffalo robes. Now I'm told that actually it was used before horses were introduced into the fire service. What can you tell me?

B. C.

Answer: At least one authority offers evidence to substantiate the earlier connotation of the term. That is the book "Fires and Fire Fighting," by John V. Morris, in which the author points out that in the 1812-20 period, men were engaged to buff the engines, referring of course, to the gaudy, nickled hand-drawn vehicles of the time. Thus the term "buffs" might well have originated before buffalo robes came into the picture.

UNIFORMS

Continued from page 929

men's uniforms. It should be said, New York was not the only city to witness the evolution of the firemen's uniform from the flamboyant affairs of the colorful volunteers to the more sober "standard blues" of the professional fire service. The fire department of every large city in the nation wrote its own interesting history on this score.

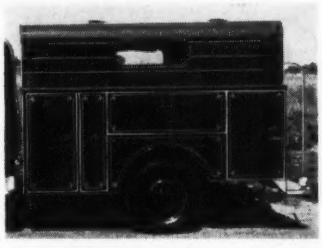
From earliest days the production of firemen's uniforms was important business for many of the cities' tailors. And it was only natural that a uniform industry should develop. Today that industry bears important names that have been linked inseparably with the fire service for generations.

Materials and methods of purchasing and tailoring firemen's uniforms and regalia may vary with the changes in styles in men's clothing. So, too, have the customs of buying uniforms been revised over the years. Not all of the uniform companies tailor all their garments; some supply only the cloth. Likewise, there is a wide difference in the uniform purchasing and inspection methods employed by fire departments.

Strangely enough, not too many fire chiefs are familiar with these different customs and procedures. Many have asked FIRE ENGINEERING to run "Round

Every Fire Department Can Afford This NEW Kind of Rescue Truck

Now every fire company—from the largest to the smallest—can have a new, modern rescue truck . . . a custom-engineered unit every fire fighter in the country would be proud of!



Closed styles for ambulatory, fire and rescue uses — also offer outstanding savings.

Prices start at $750. That's right—just $750 buys a brand new, modern rescue body with a full complement of built-in cabinets, chrome grab rails and with plenty of room for your fire and rescue crew.

You can team this new unit with the chassis of your choice, add exactly the equipment you need for the jobs you want it to do . . . and you'll have a first-class custom unit at a price far lower than you'd pay for any other unit of comparable quality sold today.

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Tables" on one or more details of uniform buying, maintenance, replacement, etc. It has been several years, however, since any concerted effort was made to catalog the uniform purchasing and wearing habits of the fire service. For this reason, the editors went to over 1,800 representative fire departments from coast to coast, with questions designed to bring forth this information. The following data results from this survey.

"Dress blues"

The fireman's uniform or "dress blues" as distinct from work or fire fighting clothing, is supplied to firemen in one form or another, by 66 per cent of the paid departments reporting.

The method of issuance varies widely and few departments completely outfit permanent men from stock, or by purchase at the time of employment. The most popular method is by cash allowances either as a regular payment at short intervals or as a lump sum twice a year. Some chiefs reported that uniforms are obtained on a matching basis, with the community defraying 50 per cent of the cost. Several others stated that the initial uniform outlay is made by the municipality and the men are expected to keep themselves supplied with the required items after that.

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Healing is 28% faster.

You will find HEXATHRICIN Aerospra particularly valuable in emergency and routine treatment of burns of all natures and all degrees of severity. It may be used with exposure or closed or pressure dressings.

Specific for all fungus and bacterial infections of the skin—poison ivy, poison oak, and indolent ulcers such as varicose ulcers and bed sores.

For literature write—
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Box 1139, Decatur, Illinois

The question of renewal of fire department uniforms, as might be expected, has widely different answers. There was little unanimity of procedure for replacement. Where this was provided for, many different methods were followed, the most predominant procedure being the replacement of worn garments following an inspection. Of those departments issuing uniforms and replacements from stock, the most frequent period mentioned was five years. However, renewal periods of from one to ten years were also reported.

Tailoring of the uniforms was done by companies specializing in the field in 84 per cent of the cases. A particular weight or make of cloth is specified by 74 per cent and a single weight is worn year round by 61 per cent of the departments. One department reported that removable linings are used during cold weather.

Volunteer procurement: Of the volunteer departments reporting, 32 per cent stated that their communities supplied uniforms. The remainder indicated that the most popular method of obtaining the "dress" regalia was by subscription of funds from the members of the community or by special events staged by the department in a drive for raising the necessary money.

Several of the departments mentioned that all the uniforms belonged to the company and were loaned to the members for the necessary functions.

Material: Specifications covering the cloth used in the uniforms were mentioned by only 18 per cent; over 75 per cent of those reporting used a single weight of cloth for the year 'round.

Replacement as needed was the most popular method, although many reported that a schedule of replacement is followed. As expected a 10 to 15-year replacement rate was prominent probably due to the less frequent use.

A compilation of both paid and volunteer uniform procedures is shown in the following summary. An interesting detail is the fact that 16-ounce blue serge is the most frequently specified uniform cloth, with 14-ounce next in importance.

Department furnishes uniform	54%
Uniform allowance granted	25%
Purchased on 50-50 basis	6%
Renewed as needed	63%
Made by uniform companies	86%
Single weight of cloth year 'round.	70%
Purchase by specification	54%

Fire station uniforms

In response to the question as to what uniform is regulation while men are on duty in the fire station, one-quarter of all chiefs replied that regular dress blues are worn at all times. Blue denim dungarees and blue chambray shirts have a slight edge over the other styles and tan or gray khaki is popular. Many departments require the company officers to wear a slightly different style from the men as a distinguishing mark. Coveralls are popular for work details in departments where the dress uniform is regulation while in quarters, and are also

supplied in a great many volunteer departments for clean-up details on drill nights, or after fires.

The following shows the preference for different materials:

Blue denim	30%
Khaki	26%
Dress blues	25%
Coveralls	4%
Other	15%

Many departments said they supply work uniforms on an annual basis of so many uniforms per year, although a majority stated that a uniform allowance was used for reimbursing the members for the expense of the garments. □□

PORTLAND FIRE

Continued from page 939

crane. All of these properties were burned.

Also destroyed were the J. M. Barde Steel Co. warehouse, nearly 1,000 feet long and 63 feet wide, one story in height and built of frame and galvanized steel; two sheds of the Alaska Junk Company containing machinery and a concrete warehouse. The main building of the Alaska Junk Company measured nearly 900 by 67 feet and was of one-story, galvanized metal on frame. Other Alaska property destroyed included a pipe shop 48 by 240 feet, another small open structure with connecting blacksmith shop and a carbide storage site. The main Barde and Alaska properties were separated only by a 31-foot gravel paved roadway.

Southwest of the Zidell properties, a number of small structures were consumed. These included a one-story frame lunchroom, another frame building and storage sheds for acetylene and other products. Completely gutted, in addition, were frame houses several blocks to the west at 0454, 0448 and 0437 S. W. Porter Street. A house at 3110 S. W. 12th Avenue, ignited by flying embers, was heavily damaged.

The blaze also swept through the 231-foot steam ferry "Malahat," moored for dismantling. Two 80-foot tugs were towed away from the blazing pier with blistered sides just in time. Several other craft also were removed to safety. Seven residences on S. W. Water Avenue, four blocks distance from the main body of fire, were ignited by flying brands but were saved by firemen and volunteers who wet down roofs and exteriors. Threatened was the Greyhound Lines garage and 30 buses on S. W. Water Street; the vehicles were hastily driven to safety. The adjacent building of the Western Foundry Co. was threatened but was saved by firemen. Employes of other concerns in the exposed area removed records and other valuables as the fire assumed conflagration proportions.

So rapidly did the fire spread that a $22,000 fire department pumper was nearly lost when the flaming west wall of the Alaska Junk Co. building gave way, throwing burning brands against the vehicle. Fireman Don West, one of the crew, braved the heat under a hose stream operated by his mates, to get into

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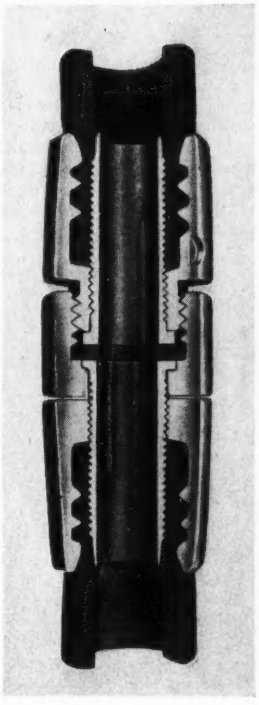
THE ACCEPTED STANDARD FOR HIGH PRESSURE HOSE COUPLINGS . . .



1. **RELIABLE**—Bar-Way builds to quality standards. We make the best possible.
2. **NO-CHOKE**—Coupling resistance to flow within plus or minus 2% of equivalent hose length.
3. **HIGH-SLIP**—Non-snagging design so that all models slip over ground obstructions.
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5. **STOCKED**—Shipments made from stock on all standard types from Stamford.

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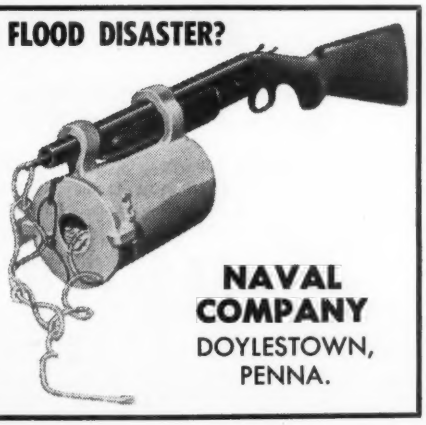

NAVAL COMPANY
DOYLESTOWN, PENNA.

the cab and drive the scorched unit to safety. Firemen West was personally complimented by Chief Grenfell for his courage.

According to Assistant Fire Chief Hal Simpson, the blaze was the toughest the department had been called on to fight since the $3 million Oregon Shipbuilding Corp. holocaust of 1945. More than 600 Portland fire fighters and about 100 Multnomah County firemen were mobilized in the actions to fight the waterfront fire. Some of the apparatus was redirected from the other two-alarmers as rapidly as it could be spared, while empty fire stations in the most hazardous areas of the city were manned by the reserve and mutual aid forces. Out-of-city units included those from Parkrose Fire Department; District 10, Errol Heights; Rose City Fire District 13; Fire District 9 at Twelve-Mile Corner and Gresham Fire Department.

Cause unknown

What started the major fire has not been determined. A crew of workers from a construction company was repairing the pier near where the fire broke out but evidence to definitely place the origin and cause of the fire are incomplete at this writing. It is certain however, the fire was of multiple-alarm proportions before the first company reached the scene.

The large area involved, the lack of available roadways and approaches, coupled with the rapid spread of the fire and resulting radiant heat and heavy smoke, making it difficult to hold positions to leeward in the gusty wind which at times assumed fire storm proportions, all complicated fire control operations, according to fire officials. Another handicap was the crowds of curious spectators, drawn to the scene by the clouds of dense smoke, the rumors of impending conflagration, the response of apparatus, and the broadcast publicity given the blaze. Fire apparatus was delayed upon several occasions by motorists who cluttered roads and by the spectators until police could get order.

The three city fireboats fought the fire from the waterside, along the long Zidell dock. Harbor patrol boats kept the boating spectators away from the scene of action.

The property loss for the major blaze alone is estimated at approximately $2 million. Several land companies and fireboats remained on the scene throughout Thursday, September 6th, wetting down the ruins. Heavy machinery, boilers and other material which dropped through the burned pier, made overhauling difficult and brought injuries to several firemen.

Another 26 fire fighters were overcome by smoke and heat, or otherwise hurt; eight were hospitalized for treatment, the most seriously injured being Fireman John McLeod of Ladder 2, whose leg was gashed when he fell through the roof of a burning house at 3110 S. W. 12th Avenue.

Firemen of Engine Companies 14 and 24 operated on the Monarch Shingle mill fire for 12 hours. Released at 11:25 p.m., and looking forward to a well-earned rest, their arrival back in quarters was delayed when they were sidetracked en route for another hour and a half, fighting another fire in a dwelling at 3706 N. Commercial Avenue. They joined other units to extinguish this blaze which damaged a two-story house to the extent of $3,500. It was after 1:00 a.m., on September 7th, when these crews hit the sack.

Commenting editorially on the episode, the *Portland Oregonian* said, "Looking back. . . . Portland should consider itself fortunate that it escaped an even more costly conflagration. For conditions were such that a large part of the southwest section might have been razed and lives lost along with the property. The Portland Fire Bureau, handicapped by two simultaneous east side fires of greater than average gravity, deserves credit for bringing the flames under control in a comparatively short time. Providence must be thanked, too, for the dying down of the stiff east wind which spread the fire to adjacent buildings and sent flying embers to sections far removed from the river." □□

Grateful acknowledgment is made to Fire Chief Edward Grenfell and his aides of the Portland Fire Bureau for information and pictures upon which this report is based.

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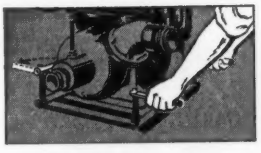
What's Burning?

THE FOLLOWING LIST includes fires of $10,000 and over in the United States and Canada for the period from August 22nd to September 17th.

Brundidge, Ala.—Brundidge Milling Co. damaged.
Opelika, Ala.—Building housing Tatum Motor Company destroyed; another building housing garage damaged.
Arkadelphia, Ark.—Dwelling of Joe Moore destroyed.
Huntington, Ark.—L. R. Smith Hardwood Co. plant and L. M. Schofield Building Specialties Co. destroyed.
Bellflower, Cal.—Triangle Grain Co. plant destroyed.
Colusa, Cal.—Ranch home of Terrill Sartain, eleven miles northeast, Colusa County, destroyed.
Eureka, Cal.—John Tsarnes Lumber Mill, 50 miles south, destroyed.
Eureka, Cal.—Parnell Lumber Co. destroyed.
Long Beach, Cal.—Partially completed cafeteria of Emerson School destroyed. Arson.
Los Angeles, Cal.—Building occupied by McCurtain Engineering Co., Cal-Togs, Inc., Benhar Products Co., Delta Electrical Instrument Co., Dalen Carton Co., Buckeye Liquor Store and Calartware Gift Store destroyed.
Los Angeles, Cal.—Handcraft Textile Printing Co. plant damaged.
Los Angeles, Cal. — Turney Hall damaged. Acetylene torch ignited paint fumes.
Marysville, Cal.—Western Hotel damaged.
Merced, Cal.—Grocery, real estate office, beauty shop, barber shop, insurance agency, doughnut shop and loan office damaged.
Milldrae, Cal.—The Arcade, 333 Broadway, beauty shop and offices, damaged.
Pico, Cal.—Carlo-Panno Fruit Co. warehouse destroyed.
San Luis Obispo, Cal.—Valley May warehouse and Westway Market destroyed.
Santa Monica, Cal.—Chain Store Market destroyed.
Santa Rosa, Cal.—Rio Dell Skating Rink destroyed.
Squaw Valley, Cal.—Squaw Valley Lodge destroyed.
Ft. Lupton, Colo.—Plant and office of Kuner-Empson tomato canning factory destroyed.
Tavares, Fla.—Fertilizer-mixing plant at Lake Region Packing Association damaged.
Atlanta, Ga. — Four business establishments housed in same building damaged.
Douglas, Ga.—Hotel General Grant destroyed.
Twin Falls, Ida.—Independent Meat Co. grain warehouse destroyed. Spontaneous ignition.
Chicago, Ill.—Abandoned warehouse owned by Armour & Co. in Union stockyards destroyed.
Chicago, Ill.—Building in 700 block, East Pershing Road, housing supermarket, beauty shop, insurance office and storm window firm, damaged.
Mooseheart, Ill.—Farm implement building destroyed.
Springfield, Ill.—Breaker house at Lake Springfield power plant of City Water, Light and Power Departments, destroyed.
Gary, Ind.—Lighthouse Restaurant damaged.
Indianapolis, Ind.—L-C Products Co., automotive water pump manufacturers, damaged.
New Castle, Ind.—Grain elevator of Farm Bureau Co-operative damaged.
Terre Haute, Ind.—Factory Outlet Store damaged.
Coggon, Ia.—Linn County Mutual Creamery Co. destroyed.
Corydon, Ia.—Three business buildings housing Hughes Appliance Store, Hi-Vee Food Store, Middlebrook Locker Plant and Rissler Barber Shop, destroyed.
Des Moines, Ia.—Two one-story buildings housing Paul Cunningham Pharmacy and adjoining Dr. Dan Toriello office and clinic destroyed.
Kansas City, Kans.—Roddis Lumber & Veneer Co., Inc., destroyed.
Henderson, Ky.—Two buildings of Argue Tobacco Co. and Soaper Tobacco warehouse destroyed.
Somerset, Ky.—Somerset Refinery, a mile out, damaged.

Starts throwing water in less than 30 seconds!

GORMAN-RUPP DUAL FIRE FIGHTER



TRULY PORTABLE. All models come equipped with carrying handles for two-man carry. Weight varies from 160 to 166 lbs. Picture shows handles in carrying position.

Fast action is urgent, when fire strikes. And when the water source is hard to reach, there's nothing more useful to carry on your truck than a Gorman-Rupp Dual Fire Fighter.

In a bare half-minute, water starts flowing through the lines. It can supply water to the truck pumper sufficient to operate two ½-inch nozzles at 100 pounds, or pump directly to the fire.

Gorman-Rupp Fire Fighter Pumps are backed by a positive plain-language guarantee. Ask your distributor for Bulletin 9-FD-11 or write direct.

Model 61½A-23FB	50 GPM @ 110 lbs.
Model 6201 FF	100 GPM @ 80 lbs.
Model 6301 FF	210 GPM @ 40 lbs.

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THE ECONOMICAL AND EFFICIENT WAY TO CARRY AND STORE WATER.

ON THE JOB - ON THE SPOT
KEEPING AMERICA GREEN

EXCLUSIVE FEATURES
- Self Supporting
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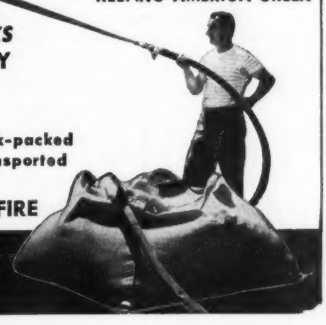
Available in 150 & 300 gallon sizes

A WATER SUPPLY AT THE SCENE OF THE FIRE



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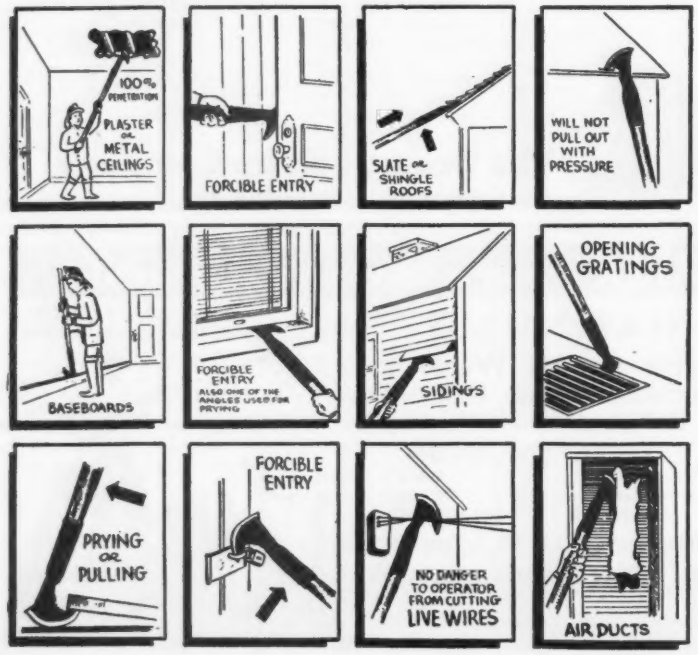
Welsh, La.—Mutual warehouse Co.'s rice dryer and warehouse destroyed.
Bath, Me.—Building formerly town hall, housing general store and garage destroyed.
Berlin, Md.—Building occupied by machine shop destroyed.
Cambridge, Mass.—Steeple of Harvard University's Memorial Hall destroyed.
Woonsocket, Mass.—Grossman's lumber yard destroyed.
Hancock, Mich.—Hodge Sport Shop, Cloverland Candy Kitchen and Lehti Jewelry destroyed.
Saginaw, Mich.—Brand & Hardin Milling Co. elevator destroyed.
Union Pier, Mich.—Biltmore Hotel destroyed.
Waseca, Minn.—Lumber storage sheds of Potsford Lumber Co. destroyed.
Jackson, Miss.—Sheppard Building Supply Co. warehouse destroyed.
Holcomb, Mo.—Cochran Hospital and Clinic and drugstore destroyed.
Kansas City, Mo.—Storage warehouse of Owens-Corning Fiberglas Corp., Fairfax District, destroyed.
Kansas City, Mo.—One-story building housing Noll Lumber Co. and Welco Manufacturing Co. destroyed. Lightning.
Missoula, Mont.—Hamilton Lumber Co. destroyed.
Wakefield, N. H. — Wakefield Congregational Church destroyed. Lightning.
East Orange, N. J.—Muir's Department Store warehouse damaged.
Hoboken, N. J.—Tenement building damaged.
Jersey City, N. J.—Four tenement buildings damaged.
Sea Bright, N. J.—Zobel Boat Works destroyed.
Brewster, N. Y.—Barn on Mount Ebo Farm destroyed.
King Ferry, N. Y.—Three barrack-type buildings of Cayuga Producers Co-operative Association damaged.
Lake Placid, N. Y.—Barn on Heaven Hill Farm destroyed.
Mechanicsville, N. Y.—Clements Motor Sales Building destroyed.
Plattsburgh, N. Y.—McHattie Block, business and apartment building, housing Dodge and Frazier Jewelry Store, The Millinery Shop, Inc., Glen Barber Shop, tailor shop and apartments, damaged.
Utica, N. Y.—Building at 58 Genesee Street damaged.
Charlotte, N. C.—Warehouse and building materials owned by W. E. Love, destroyed.
Chillicothe, Ohio—First Presbyterian Church destroyed.
Donnelsville, Ohio—School building damaged.
Medina, Ohio — Hausted Mfg. Co., medical equipment manufacturers, damaged.
Holdenville, Okla.—Moeller Truck & Implement Co. destroyed.
Independence, Ore.—Balkenburg Hop Ranch destroyed.
Klamath Falls, Ore. — Bratton Meat Packing plant destroyed. Leak in gas line.
Nehalem, Ore.—Neahkahnie Lodge building destroyed.
Philomath, Ore.—Chap-wood Oregon, Ltd., fiber plant, destroyed. Welding sparks.
Philomath, Ore. — Clemens shingle mill destroyed.
Portland, Ore.—Monarch Shingle Co. destroyed.
Portland, Ore.—Alaska Junk Co. destroyed.
Portland, Ore.—Schnitzer-Zidell-Wolfe shipyard destroyed.
Portland, Ore.—Dwelling of Julius Caesle and three adjoining dwellings, destroyed.
Salem, Ore.—Boathouses, tug boat and Oregon Pulp & Paper Co. destroyed. Explosion.
Aldan, Pa.—Aldan School destroyed.
Chester, Pa.—Factory building destroyed.
Nazareth, Pa.—Nazareth Fairgrounds damaged.
Philadelphia, Pa.—Five firms in section of Dock Street whole market area, destroyed.
Progress, Pa.—Hardware store and adjoining buildings damaged.
Reading, Pa.—Armour & Co. plant damaged.
Swarthmore, Pa.—Parrish Hall Annex at Swarthmore College damaged. Frying food on hot plate.
Thorndale, Pa.—Warehouse adjoining plant of Eagle Paper Co. damaged.
York, Pa.—Barn on William H. Brown farm at nearby Porter's Siding, destroyed. Spontaneous ignition.
Lenoir City, Tenn.—Building housing Dunlap Cafe and Lenoir City News destroyed.
Cleveland, Tex.—Butler-Grimes Co., Inc. Store No. 19, and Texas Jewelry Store, destroyed.
Dallas, Tex.—Clubhouse of Preston Hollow Country Club destroyed.
Gatesville, Tex.—Cafe, auto agency and shoe store destroyed; adjoining Western Auto Store and barber shop damaged.
Enumclaw, Wash.—Gateway Feed Co. plant destroyed.
Oaksdale, Wash.—Kersey Hardware Building and tavern destroyed. Explosion.
Seattle, Wash.—Wilson & Hays Furniture Manufacturing Co. destroyed. Rubbish fire.
Vancouver, Wash.—Fernandez Logging Co. destroyed.
Williamson, W. Va.—Consolidated Trailways bus terminal, Victory Hotel and adjoining restaurant destroyed; Masonic Temple, Alvon Hotel, Leatherwood Dairy and apartment building damaged. Fuel truck exploded.
Fairbanks, Alaska—Rendezvous Night Club destroyed.
Fairbanks, Alaska—Squadron Club destroyed. Arson.
Burnaby, B. C.—Latimer's office building destroyed.
Cocksville, Ont.—Two storage sheds and office of Conners Sales Co., four miles east, and trailer of Earl Biggs destroyed.
Cornwall, Ont.—Hotel owned by Fred LeFebvre and adjacent apartment building destroyed.
Berthierville, Que.—St. Joseph's High School damaged. Defective wiring.
Lambton, Que. — Hotel Nationale and two dwellings in Frontenac County destroyed; door and window manufacturing plant, reception hall, church parish hall and neighboring hotel damaged.
Sherbrooke, Que.—Building housing stores and offices in downtown section, damaged. Lightning.

The EK-HOOK

ASK ANY FIREMAN WHO HAS USED ONE

★ PATENTED



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It outmodes the old pike poles.

HEAD is forged S.A.E. 4340 chrome-nickel molybdenum alloy steel, heat treated for maximum hardness and toughness, ground and sharpened.

HANDLE—Selected straight-grained ash. Designed for demolition, ventilation, forcible entry.

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EK-HOOK HEADS FULLY GUARANTEED. ALL EK-HOOKS EQUIPPED WITH LEATHER SHEATH.

C. D. PIKE & FIRE HOOK MFG. CORP.,
NEW HAVEN 10, CONN.

Pacific Coast Inter-Mountain Chalks Up Successful Conference

The 61st Annual Conference of the Pacific Coast Inter-Mountain Association of Fire Chiefs, held in Sacramento, Cal., August 21-24, set new records for attendance, business program, entertainment and enthusiasm.

Tuesday, the 21st, was given over to entertainment, the conference business sessions getting underway on Wednesday, with welcoming addresses and remarks by Chief William Fitzgerald, president of the International Association of Fire Chiefs. Chief Wayne Swanson, first vice president of the International also spoke. The speaker at the noon luncheon was Jay Stevens, secretary-treasurer of the Pacific Coast Inter-Mountain Association. More entertainment and demonstrations of fire extinguishment followed.

On Thursday, prominent speakers included Captain Raymond Straeter, Los Angeles Fire Department, who discussed "Arson"; Chief Ivan Pearson, McMinnville, Ore., whose topic was "Volunteer Fire Department Problems"; DeWitt Nelson, Director of Natural Resources, State of California, who talked on "Natural Resources."

The afternoon session was all business, with Charles S. Morgan, Assistant General Manager, National Fire Protection Association, explaining what that association means to the fire service; Chief H. C. Fisk of Tacoma, Wash., covering "Communications in the Fire Service"; and William Landon of the Southern California Gas Co. putting on a film talk about natural gas fires.

More educational subjects were discussed Friday with Professor John Rathmell of Pasadena, Cal., ably expounding on "Psychology in the Fire Service." He was followed by Assistant Chief Edward Boatright of the Portland, Ore., Fire Department, who took for his topic "Public Relations." The morning session concluded with a top-level paper by Chief W. L. Miller of the Los Angeles Fire Department. He was introduced by his predecessor, Chief John H. Alderson.

Carl A. Weers of the National Board of Fire Underwriters, San Francisco, described "The Million Dollar Fire—Today's Problem" in the final session.

The featured speaker at the banquet was the Rev. Dr. J. Whitcomb Brougher, Jr., First Baptist Church of Glendale, Cal.

Elected to succeed Chief S. H. Edmondson of Pasadena, Cal., as president for 1957, was Chief J. T. Caldwell of Ellensburg, Wash. Chief Keith E. Klinger of the Los Angeles County Fire Department was named first vice president and Chief Ivan Pearson of McMinnville, Ore., was elected second vice president. Jay Stevens was re-elected secretary-treasurer.

Chief Thomas Deise, new head of the Sacramento Fire Department, was conference host. No conference city was named for the 1957 gathering; this will be decided at the mid-winter gathering.

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PORTABLE ELECTRIC PLANT
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To The Chief!

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Names and dates in solid bronze

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HOW TO ORDER:

Simply fill in blank below with Chief's name, town, years in which he served (no dates are included for active Chiefs), and—state whether Volunteer or Municipal. Send no money. We will bill you later. (Note: Firemen's plaques for other officers and special plaques of all types can be supplied on request.)

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Chief's Name.....
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PLEASE PRINT

Persons in the News

Leo Driscoll New Boston Chief

Leo C. Driscoll was named Chief of the Boston, Mass., Fire Department on September 7, succeeding Chief Edward N. Montgomery who had reached retirement age.

Chief Driscoll was appointed to the fire department on May 28, 1927, and assigned to Fireboat Engine 47. He was promoted to lieutenant on July 9, 1937, and to captain January 28, 1942, assigned to Engine 13. On May 17, 1944, he was named district chief in which capacity he served in East Boston, Roxbury and in town. He was advanced to deputy chief on August 2, 1950, operating in Divisions 1 and 2, and on April 6, 1955, he became assistant fire chief in charge of personnel and training.

Chief Driscoll is a veteran of World Wars I and II, holding a chief engineer's license. He attained the rank of lieutenant commander in World War II.

During his tenure as training and personnel officer, he was given the task of completely overhauling the existing training program and establishing new schools of instruction requisite to bringing the department to top efficiency. Under his direction these schools of instruction were set up, or broadened: Officers' Training School, Ladder Pipe Procedure, Single Unit Procedure, Housing Project Elevator Rescue Procedure, Probationers' Training School and Metropolitan Transit Authority Rescue Procedure.

Chief Driscoll had encouraged other numerous improvements in the department, including the addition of two new 100-foot metal aerial ladders embodying distinctive features; conversion of hose wagons to engine squad units, carrying all latest type rescue equipment, with a 750 gpm pump and other features. He also instituted a program of annual pump testing and preventive maintenance.

The new chief was in charge of civil defense for the fire department and in that capacity he established a civil defense auxiliary fire department with training centers throughout the city.

In 1955, Chief Driscoll was appointed a member of the NFPA's Training Committee, and the Boston Mayor's Automotive Advisory Committee. He is a member of the International Association of Fire Chiefs, the New England Association of Fire Chiefs and the Fire Chiefs' Club of Massachusetts.

E. L. Smith Chief at Eugene, Ore.

E. L. Smith, Chief of the Salem, Ore., Fire Department for the past four years has resigned from that position to head the Eugene, Ore., Fire Department. He replaces Chief Ed Surfus, who resigned.

Chief Smith was a member of the Salem Fire Department for 32 years. He is currently secretary of the Oregon Fire Chiefs Association.

Top Command of LAFD Reorganized

Reorganization of the top echelon of the Los Angeles City Fire Department took effect June 25 when Chief William L. Miller appointed seven new deputy chiefs.

The new team which will run the West's largest fire department will be headed by Deputy Chief Donald T. Hibbard in charge of administration.

Other appointments include Deputy Chiefs Carl N. Carter, personnel and

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Simply by checking with Cardox *first,* you'll be sure of getting equipment, apparatus or information that represents the newest and most advanced in fire protection thinking. Recent additions have broadened the Cardox Line — make it more desirable than ever to find out what Cardox has done before you buy or specify *anything* in . . .

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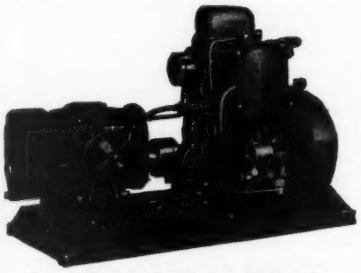
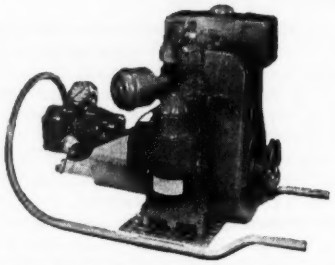


Type Y Pumper Length 24", Width 12", Height 15¼", Weight 70 lbs.

PUMPER PERFORMANCE—Y

Pressure	100	125	150	175	200	225
Gallons per minute	63	59	53	46	40	20



Type WA-7-S Pumper (with electric starter) Length 27", Width 18", Height 20", Weight 130 lbs.

PUMPER PERFORMANCE—WA-7-S

Pressure	50	100	150	200	250	300
Gal. per min...	22	21	20	19	17	14

Pacific is prepared to supply from stock a complete line of fire suppression equipment including fire hose, fire extinguishers, nozzles, etc.

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FIRE EQUIPMENT DIVISION
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training; Harold N. Johnson, building and sites; Eric A. Lotz, shops and maintenance; William Goss, Area I fire fighting (south and east half of city); Marvin E. Meador, Area 2 fire fighting (north and west half of city and Mountain Patrol).

Deputy Chief Raymond Hill will be Fire Marshal and in command of the Bureau of Fire Prevention.

Battalion Chief Harry Gross was elevated to assistant chief rank and named as Fire Prevention Engineer and Chief Hill's assistant.

Four captains, J. A. Thompson, E. J. Canfield, W. C. Runyan, and C. M. Rossie, were promoted to battalion chief rank.

The new chiefs were selected after civil service examinations.

—Cliff Dektar

C. E. Underwood, Wexford County, Mich., CD Head

Charles E. Underwood, Chief of the Manistique, Mich., Fire Department for 24 years until he accepted a position as fire prevention engineer with the U. S. Army in 1942, has been appointed Civil Defense Director for Wexford County, Mich.

For the past nine years, until his resignation to take the CD post, Chief Underwood has been Michigan representative for the Fire Apparatus Division of the John Bean Company.

Herbert Named Dallas Marshal

Fire Chief C. N. Penn has announced the appointment of Captain Guy Herbert to the post of fire marshal of the Dallas Fire Department.

Chief Herbert succeeds Chief William C. Burns who died recently. Entering the department in 1942, Chief Herbert rose through the ranks as a fire fighter. In addition to his fire prevention duties, he will supervise the department's public relations activities.

Hill Heads NFPA Committee

Raymond M. Hill, Deputy Chief, Los Angeles Fire Department, has been appointed Chairman of the NFPA Committee on First Aid Fire Appliances. The committee is responsible for creation of standards on the selection, installation, and maintenance of fire extinguishers.

J. L. Risinger Retires

Joe L. Risinger, safety head of Socony Mobil Oil Copany, Inc., retired on June 1 after serving the company 37 years. He is the inventor of an agitation method of extinguishment or control of oil tank fires, now in world-wide use.

Mr. Risinger plans to make himself available to industry as a consultant on the safety of personnel and on fire protection. He resides at 13 Euclid Avenue, Maplewood, N. J.

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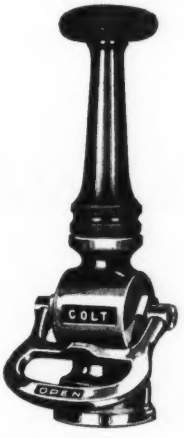

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THE WATCH DESK

overhauling the firemanic news of the day

Drum Major's Baton Soars

It was the night of the Hamlin, N. Y., Volunteer Fire Department carnival parade. The flags were flying; the bands were playing; the firemen and their spick-and-span apparatus were all in line. The parade was on.

Right up front was 18-year-old drum major Irving Gilman, who tossed a mean baton. Came the big moment and Gilman flipped his wand high into the air.

It landed—Gilman knew not where. Like the top-notch drum major he is, Irving just stuck out his hand for the descending baton. He never followed it with his eyes, that isn't done among drum majors. "I just put out my hand," Irving said, "and the baton falls into it."

But the night of August 10, the baton soared into the air—and stayed there, leaving Irving empty-handed. And where was the baton? It had fused to 5,000-volt power lines suspended across the road, while all the lights in the area went out.

The parade went on, but under handicaps, it is recorded. Electric service was finally restored an hour and a half later.

High School Pupil "Explodes"

Richard F. Mehl, 14-year-old student of Hamilton Junior High School, Long Beach, California, carried a pocketful of sodium peroxide crystals into his classroom to conduct an experiment. According to his teacher "he suddenly exploded."

Classmates stripped off his burning clothing and Richard was taken to the hospital for treatment of painful burns. Cause of the unusual accident was attributed to body perspiration coming in contact with the crystals. The community was experiencing a heat wave of 99 degrees at the time.

Terminology Twist

When the new Commercial Credit Building was being erected in Baltimore, Md., workmen installed a prominent sign over the standpipe connection. Marked *Fire Dept. Siamese*, it created much interest among members of the Sidewalk Superintendents' League. The Baltimore *Sun* wondered if it was reserved exclusively for visiting firemen from Thailand or for "twin" fire fighters. ***Irving Johnson***

Hot Off the Tape

Speaking of extra-curricular activities, the Bellport, L. I., vamps were called upon recently to go to the aid of a Long Island Railroad train at the Bellport station. Seems the diesel engine was without water. So Bellport's pumper went to the scene, filled 'er up with the vital liquid, and engine and vamps proceeded on their way (Thanks John Hancock). . . . *Put out a burning street* is the way the order to the Leoni Township, Mich., Fire Department read. It was no fake call—a flaming 60-foot length of roadway had been treated with waste oil to lay the dust. But lacquer thinner in the oil was ignited by a discarded cigarette. . . . In Palo Alto, Cal., Clark Lacey was electrocuted August 1 when water from a garden hose came in contact with a grounded 2,300-volt power line as he attempted to put out a grass fire. . . . Two children, aged 6 and 5, burned to death in a doghouse on July 26 while their mother frantically tried to free them. Mrs. George Ruby of Harmony, Pa., saw flames and smoke pouring from the wooden doghouse where her children, Diane and Robert, were playing. The mother upset a two-and-a-half-foot high box in her rescue efforts, but heavy plank flooring prevented her saving them. Firemen said the children apparently were playing

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(1) Solar Plexus Technique – Simple – Safe –Efficient.

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(3) Current–Tested and proven by years of research in the field of electro-physiology.

(4) Absolutely Safe for All Age Groups.

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Visit with us at the I.A.F.C. Meeting in Miami

NO Mask

NO Oxygen necessary

NO time limiting factors

Every rescue team will want to know about this new, revolutionary method of life saving — write —

BATROW LABORATORIES, INC.

Branford, Connecticut

with matches and ignited straw that lined the bottom of the shelter. . . . Alfred Alonzo, proprietor of a fireworks manufacturing plant at Mechanicsville, N. Y., was injured fatally July 24 in an explosion and fire that destroyed a shed at his plant. . . . Marion, Ill., fire fighters battled a dining room blaze in a motel for an hour July 15, just before a large church group was scheduled to dine there. As a reward, the brothers shared a dinner they helped to save (Thanks Jack Kearns). . . . Sixty days in the workhouse was the fine imposed on a culprit for having damaged the equipment of the New York Telephone Company in a New York City subway station. However, magistrates are still fining false alarm offenders who endanger the lives of scores of firemen, the munificent sum of $25 (Jerry Daly in the *Chief*). . . . In Peekskill, N. Y., it was hot as hades in her attic, the lady caller told the fire alarm bureau. Would it be all right to store some clothing there, or was there a chance of fire? The dispatcher pondered like a Solomon for a moment, then assured his caller that he, too, had just stored his winter clothes in the attic. . . . In Beaver, Okla., tornado-conscious residents took to their storm cellars when the town's fire siren sounded. Seems signals got crossed or something; the siren wasn't sounding for a tornado but was a signal for local firemen to hustle to nearby Forgan to help put out a bad fire in that place. . . . When a trailer truck crushed an automobile on the Boston Post Road at Norwalk, Conn., a human conveyor belt of sixty persons unloaded 30,000 tons of spuds from the truck, enabling firemen and police to free three persons trapped in the auto. The crash wrapped the small car around a telephone pole, with the trailer on top of it. All three, a man, his wife and another male, were trapped for two hours in the wreckage. Hospitalized, their condition was reported good. . . . Another *Left Alone with Death* story: In Jersey City, N. J., a 4-year-old boy died of burns suffered from a fire caused, firemen say, by a lighted cigarette, left behind on a mattress when the mother went shopping. Two other children were saved by neighbors. . . . Three times in one week fire trucks of Jamestown, N. Y., answered false alarms from a busy intersection. Detectives tracked down the party responsible, a 6-year-old girl who said she just wanted to see what would happen. Her mother said it would.

Starts Auto with a Bang!

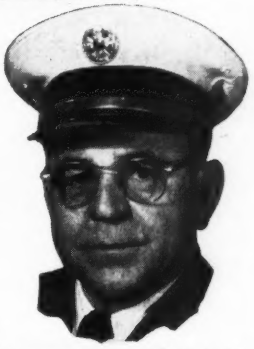
Robert Lewis, 27, of Columbus, Ohio, worked on a farm run by Glenn Howes, north of Lancaster, Ohio. He somehow lost the keys to his car. Deciding to cross wires to get his auto started, he went into the Howes garage and picked up a likely looking piece of "wire" which he touched to the ignition wire.

Farmer Howes brought Mr. Lewis to Lancaster-Fairfield Hospital where the Columbus man was treated for burns on his forearms and legs. Seems the wire he had touched to his ignition was a fuse wire with a dynamite cap on it.

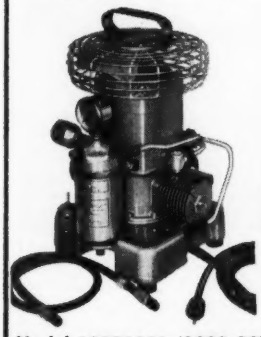
From one chief to another . . .

"The *Cornelius*
HIGH PRESSURE
AIR COMPRESSOR
IS PROVING ITS VALUE TO US
MORE DAY-BY-DAY"

— Chief W. L. Hydaker, Lima, Ohio



The chief commends the Cornelius Compressor in his annual report: "The bank of cylinders containing washed compressed air which we installed at our Central Station during 1954 proved to be very unsatisfactory, and we purchased and placed in service during 1955 a Cornelius 3000 p.s.i. air compressor which has solved the problem of keeping our Air-Pak cylinders at the proper pressure at all times, and in addition, it enables this department to keep an ample supply of compressed air in cylinder storage for emergency use."



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Annual Reports

Nassau County, N. Y., losses down 12%

Fire Marshall George W. Clough reported losses of $3,584,315.00 for the year 1955. This represents a decrease in fire losses of 12% over the previous year. Of the 9,628 alarms received by the 70 Fire Departments, 8,350 were for grass or brush.

A record total of 552 investigations of fires were made during the year. Malicious mischief accounted for 102, mainly caused by children trespassing in vacant buildings. Ten adults and 17 children were taken to court where 24 convictions were obtained and three retrials are pending.

Detroit Reports Increased Arson

The report of the Arson Section, Fire Prevention Division, Detroit Fire Department for 1955 shows 2224 fires investigated—an increase in activity of 27 per cent over 1954 and the highest total since the organization of the section in 1921.

Of these fires, 184 were of incendiary origin with a loss of $417,593. Mentally deficient persons set 105 fires and 52 were by persons seeking revenge. Seven were set to conceal crimes and one for the purpose of defrauding an insurance company. In 119 of the cases, conviction or commitment of the offenders was obtained, including 91 adults and 51 juvenile offenders.

In addition, 215 adults were cited for negligence such as smoking in bed in a hotel or rooming house where a fire occured; 15 were hotel managers who failed to report such fires as required by law. Of this total, 200 convictions were obtained. False alarms resulted in 35 arrests and 31 convictions were obtained.

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Weighs only 67 ounces (including battery)... but this rugged light has A HALF-MILE BEAM!

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"The Commando" is a quality light in every detail. Stainless steel construction for good looks through the roughest jobs in any weather. Water-proof battery that gives 5 hours of continuous use. Non-scratch lens. Trouble-free switch. Built-in compartment for spare bulb. Available with reflective "Scotchlite" jacket.

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Alexandria, Va., Notes Home Inspections

The Bureau of Fire Prevention made a total of 2016 calls in the home inspection campaign by the Alexandria Fire Department. Chief Bernard J. Padgett reported that firemen met with only 32 refusals in the voluntary program.

Total alarms for 1955 were almost identical with the previous year as was loss valuation. The Department Rescue Squad responded to 2,254 emergency calls for a busy year.

Austin, Tex., Casualties Set Record

Chief J. E. Woody in his annual accounting reports that fire alarms were down 11 per cent and loss valuations down 5 per cent in 1955, but in contrast, there were 11 deaths and 60 injuries from fires—an all-time high.

Milwaukee '55 Losses Exceed '54

The Milwaukee Fire Department report of Chief Edward E. Wischer for the year 1955 shows an increase in fires of 12 per cent and losses of 21 per cent over the previous year. Alarms increased from 9,060 in 1954 to 9,878 last year. This was partly accounted for by the annexation to the city of a suburb increasing the area by 7 per cent.

The annexed portion is without hydrant protection and the department has added two pumpers with 1500-gallon tanks to provide water supply when fighting fires in the new section.

Los Angeles County Losses Down

The latest of the interesting and comprehensive annual reports of the Department of Forester and Fire Warden and County Fire Protection Districts, Los Angeles County, Calif., that for 1955, by Chief Engineer K. E. Klinger, is most enlightening. Factually, losses were down over $200,000, dropping to $4,575,473 for the fiscal year July 1, 1954 to June 30, 1955. Of this total, 14 fires accounted for 46 per cent of the destruction. Fire Alarm dispatchers reported 12,023 incidents of which 8,305 were actual fires.

The department responded to 364 calls for assistance, mainly to cities within the

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preparation for respiratory accidents is *mandatory*. New Gases are causing greater need for quick, effective combative measures.

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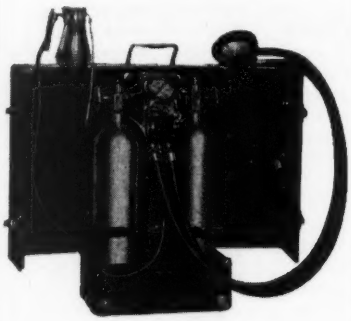

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county. The county received assistance 227 times. Training played an ever-increasing role and plans are now being made in cooperation with the Civil Service Commission for a two year course on the Junior College level for firemen with an Associate of Arts degree to be awarded upon completion.

Effective April 1, 1955, the department was reorganized into three divisions with a total of eleven battalions. Two additional battalion chief positions were added at the time due to the expansion. Nine new fire stations were opened during the year, and eleven new stations are planned to keep pace with the growth of the county; five other stations are in line for replacement.

Atlantic City Losses $1,053,790

A total of 812 alarms were reported by Chief Zenus Mathis for the year 1955, in his annual report of the Atlantic City, N. J., Fire Department. Of these 659 were actual fires resulting in a loss of $1,053,790. Of the 212 street box alarms, 61 were false and of 586 telephone reports, 23 were false.

Lubbock, Texas, Losses Up

The attractively printed and bound report of Chief Glenn W. Smith for the year 1955 shows fire losses of $335,658, an increase of over 30 per cent. Of the 1450 alarms, 1052 were for actual fires. Salaries were increased for all personnel and longevity pay of $2.00 per month for each year of service is granted to all personnel below the rank of chief. Improvements in the department have resulted in a National Board classification change from Class 7 to Class 4, with corresponding fire insurance premium reductions to property owners in the city.

Garden City, N. Y., Losses Up

Chief Henry D. Sayer, Jr., reports the number of fires in this Long Island village about the same as in 1954 although losses practically doubled. The work week of the paid men was reduced to 56 hours during the year.

Reading, Mass. Wants Radio

The report of the Reading, Mass., Fire Department, Chief Hugh L. Ames, for 1955 urges increase in the 20-man permanent force, and two-way radio for all apparatus, with separation of fire and police frequencies. Use of smoke ejectors by the department was reported.

Municipal Fire Departments in Ontario, 1955

Over four million people and five billion dollars worth of property are protected by fire departments in the Province of Ontario, according to the tabulations released by the Ontario Fire Marshal's office, W. J. Scott, Marshal.

There are 473 municipalities having their own fire apparatus and personnel,

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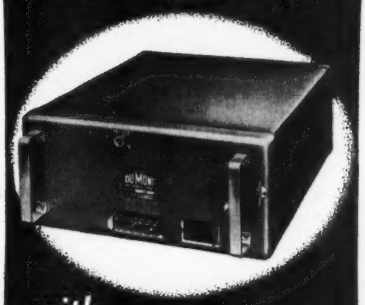
. . . when you need it!



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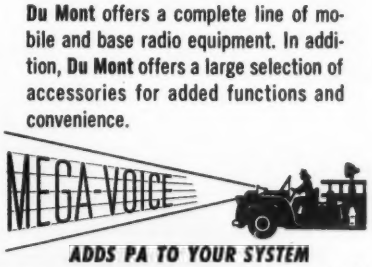

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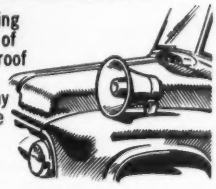
Just the thing for giving instructions at scene of emergency. Weatherproof speaker mounts on vehicle. Messages may originate from vehicle or from base station through mobile unit.



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and fifteen municipalities purchasing fire protection from outside.

There are 3,391 full-time and 8,590 volunteer firemen. Of the 43 counties and 11 fire districts having organized fire protection, 23 counties are functioning under the Fire Civil Defense County Mutual Aid System.

Singapore Report Records Tragedy

The annual report of the Singapore Fire Brigade for the year 1954 chronicles the loss of an officer and four men at a serious fire involving a godown on April 20 of that year. These were the first fatalities suffered by the brigade in the quarter of a century of its operation.

The year saw a reduction in fire calls of 9 per cent and a marked decrease in property losses. It is of interest that the areas covered by the Singapore and the New York City Departments are roughly similar in size. New York, however, receives three times the number of calls annually. The report attributes this greater activity to the drier atmosphere prevailing in New York.

Speaking of false alarms, Singapore classifies them this way: False alarms with good intent, 57 in 1954 and 38 in 1953; False alarms due to a mechanical defect: 4 in 1954 and 7 in 1953; Malicious false alarms: 24 in 1954 and 17 in 1953.

Canada Losses Up, 1954

C. A. Thomson, Dominion Fire Commissioner and Executive Officer, D.F.P.A. reported that 74,544 fires of all types accounted for a loss of $101,309,862 an increase of $7,000,000 over 1953. Forest fires accounted for losses of $1,946,610. Of the 479 fatalities, 216 were children.

Rock Island Losses Down

The Annual Report for the year 1955-6 of the Rock Island, Ill. Fire Department, Chief Charles J. Wahlheim, shows losses of $68,736 compared with the previous fiscal year total of $428,345. There were 595 alarms of which 408 were for actual fires.

The comprehensive report includes charts and diagrams as well as complete statistics on fires, fire fighting operations, prevention training investigation, etc. An interesting item is the way the work of companies and pumping units is recorded by "miles traveled" and "pumping miles."

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JAVELIN NOZZLE*
CUTS THROUGH . . .
TO THE SEAT OF THE FIRE!

Has many uses—designed to operate with water pressures up to 800 pounds with no back pressure, and with CO_2.

WHAT IT DOES:
Gets the stream right to the seat of the blaze without cutting large holes in any object. It saves water—a real advantage when depending on a tank truck for supply.

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Four cutting edges of manganese bronze. No moving parts to get out of order. Will pierce many materials instantly and can be removed with little effort. Can be sharpened perfectly in seconds with a file.

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* Patent #2411231

Performance Data

at 200 pound pressure approximately 18 gallons per minute.
Fog diameter ..... 20 feet
Fog depth ..... 11 feet

at 600 pound pressure approximately 28 gallons per minute.
Fog diameter ..... 32 feet
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Can be used with ¾" or 1" Booster and 1½" hose.
When ordering, specify size and thread of shutoff nozzle

Dealer inquiries invited! Write for details today.

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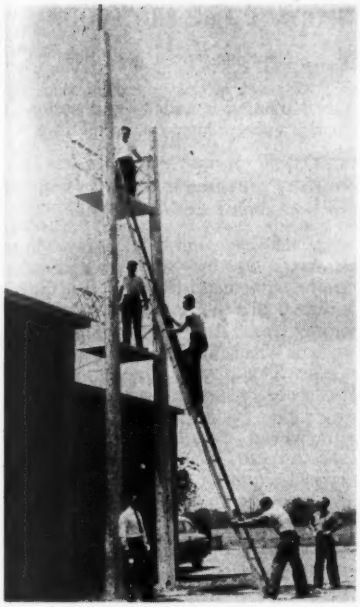
SEDGWICK COUNTY

Continued from page 941

To acquaint all of the county's residents with their service, the county firemen have distributed rural telephone directories. A sticker is placed on the front of each book giving information about the department with instructions on how to report an alarm using the location code included with the other information. When the firemen call upon the residents these instructions are carefully explained

Assistant Chief Eugene Otti models the snappy "dress blues" of the Sedgwick County Fire Department



Each station has its own drill tower which the department constructed at the fantastically low cost of $8 each. The welding service, paint and bolts were purchased; the local electric power company supplied the poles, and the County Engineering Department furnished the platforms and railings from salvaged bridge materials

and any questions are answered right on the spot.

In addition, an inspection program has been instituted for all public and industrial buildings. This has helped familiarize firemen with their territory and as a result many hazards have been corrected or eliminated. Since May 1955, when the program started, over 560 inspections have been made. □□

The Editors wish to thank County Commissioners Howard B. Scott, John Edwards, Jr., and Byron C. Farmer; Chief Raymond A. Davis; Assistant Chief Eugene Otti; The Beech Aircraft Corp.; the "Kansas Farmer," and the "Arkansas Valley Farmer," for the information and photographs contained in this story.

Voice Recording Ignored

A telephone tape recording of a man's voice reporting what proved to be a false alarm was not admitted as evidence by a New York Police Court Magistrate recently.

On July 7, 1956, a man telephoned from a grocery store and reported a fire at a West 120th Street address. When the responding companies found no trace of the fire they called the dispatcher to verify the location.

Police and firemen apprehended a man whom the grocer identified as having used the phone a few minutes previous. When arrested by police the man gave the same address as that of the reported fire.

When the tape recording of the voice was produced in court, the Magistrate refused to listen to it and dismissed the complaint for lack of evidence.

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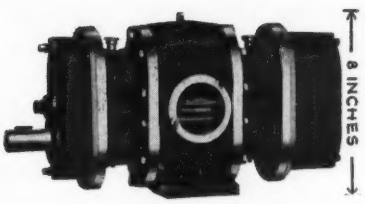

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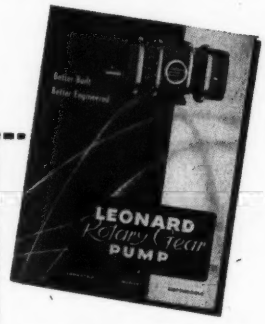

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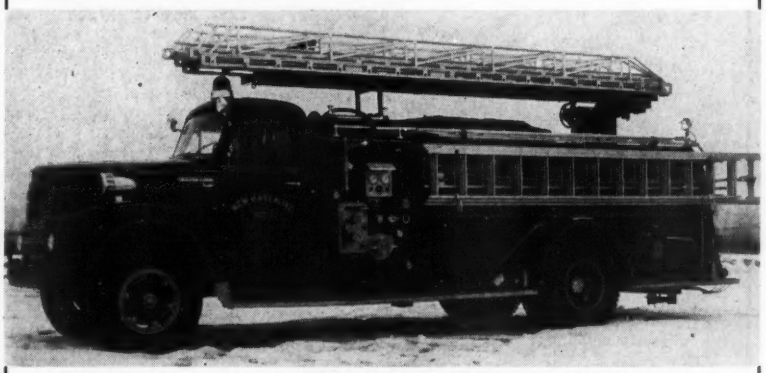
The MEMCO AERIAL LADDER, pictured below, is a versatile piece of apparatus. It can be built into a new fire truck, or in some instances an existing fire truck can be modified. Ask your local fire truck manufacturer for details.



(Photo courtesy Howe Fire Apparatus Co., Anderson, Indiana)

Now there is no reason why your Department should get along without aerial apparatus—the MEMCO AERIAL LADDER (available in 50 and 65 ft. lengths) has been priced to fit into even the modest budget.

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- Activating tone also serves as alarm.
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- Crystal frequency control.
- 5 tubes and rectifier.
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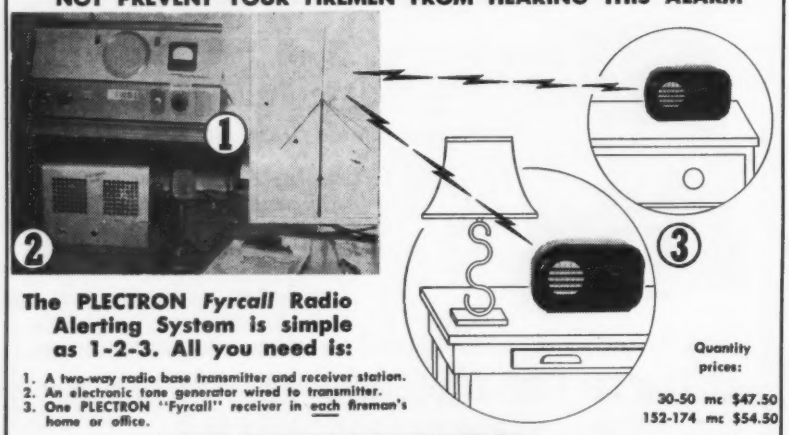

The PLECTRON *Fyrcall* Radio Alerting System is simple as 1-2-3. All you need is:

1. A two-way radio base transmitter and receiver station.
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3. One PLECTRON "Fyrcall" receiver in each fireman's home or office.

Quantity prices:

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Lewistown 4, Pennsylvania

THRUWAY FIRE PROTECTION

Continued from page 944

Actual training is under the direction of Charles Fales, Chief, Bureau of Fire.

Thruway procedures for handling fire equipment and personnel

As said above, every effort is made to extinguish fires by the Thruway personnel and equipment. However, it is the inflexible policy to call outside fire fighters for any fire of serious proportions, or any incident which would indicate their usefulness. Should an emergency, including fire, occur on or adjacent to the Thruway within the fire protection district of a municipal fire department (paid or volunteer), and that department respond to a call sent it by a passerby or someone traveling the Thruway, its services will be welcomed by the Thruway Authority, even if it should be that the Thruway personnel have the situation well in hand.

Reporting a fire

When a fire occurs on the Thruway right-of-way, the incident is reported by radio, usually by police radio car to the Thruway radio system dispatcher at division headquarters.

The official vehicle or station reporting the incident gives the dispatcher the exact location of the fire by nearest milepost and lane, the type of fire (vehicle, structure, brush, etc.) and its extent.

When the report of a fire is received, the dispatcher immediately sends a State Police Thruway Detail patrol car and emergency service equipment to the scene (if one is not already present). If the fire is reported as serious or extensive, the dispatcher contacts the toll station nearest to the location of the county fire coordinator in the county in which the fire is located, and the toll collector on duty in turn, calls the fire coordinator by phone and requests assistance. The county fire coordinator dispatches fire equipment located in the vicinity of the Thruway toll station nearest to the scene of the fire.

In this connection, it is well to remember that the State of New York is organized on a statewide mutual aid basis. Coordinators and deputy coordinators are appointed by county authorities in each county and they are charged by law with administering and maintaining the mutual aid and training programs of their respective areas. This includes the operation of the county fire control center which is in almost every case the focal point for the dispatch of reinforcements in time of serious fire or other disaster, and for protection of highways, parkways and thoroughfares which may not be owned by the counties, municipalities or communities through which they pass.

The collector assigned to an entrance lane at the station where the public fire force and personnel will enter is alert to their arrival and offers all possible assis-

tance in expediting them through the lane.

As soon as the equipment and personnel have entered the Thruway through the portal, the collector will:

a. Notify the Thruway dispatcher

b. Issue "Class 9" non-revenue tickets for each piece of apparatus or vehicle carrying fire fighting personnel; these tickets are turned over to the collector on duty in the lane through which the equipment and vehicles of personnel will later exit.

c. Make a notation of the incidents on his Unusual Occurrence Report, giving the time and serial numbers of the entrance transactions.

When the collector on duty at the exit lane hears the trooper at the scene of the fire advise the dispatcher that the fire equipment and personnel have left the scene, he is alert to their arrival and assists them through the lane. As soon as the equipment and personnel have exited, the collector will:

a. Notify the dispatcher

b. Process the Class 9 tickets obtained from the entrance collector, using his own identification plate.

c. Make notations of the incidents on his Unusual Occurrence Report, giving the time and serial numbers of the exit transactions.

The Thruway's mobile radio network keeps all emergency and toll units in touch with what is going on.

Procedure for handling fire forces on trips for off-Thruway emergencies

Under the previously mentioned State Mutual Aid Plan, fire equipment and personnel may be dispatched by the county fire coordinator to assist at the scene of a fire or other disaster in another county or community.

In certain cases, it may be advantageous for these responding fire forces to travel via the Thruway to reach the scene. If the Thruway is to be used in this connection, the fire units involved are expected to make every effort to advise the nearest toll station of their entry, in order that there may be no undue delay at that point. In some cases, the county fire control center, which handles the dispatching of mutual aid forces, may alert the Thruway authorities to the movement of men and apparatus.

When the fire equipment and/or the vehicles of fire personnel approach the entrance station with flashing red or blue lights "legally" displayed:

The collector on duty will issue a Class 9 non-revenue ticket and hand it to the operator of each vehicle with such legally displayed lights. The collector is to note the names of the fire units and circumstances, on his Unusual Occurrence Report, and then notify the dispatcher that the equipment and vehicles have entered the Thruway and will exit at a specified station. The dispatcher will then advise the exit station of the approaching fire units. The collector on duty at that station will be on the watch for the vehicles and prepared to process them through

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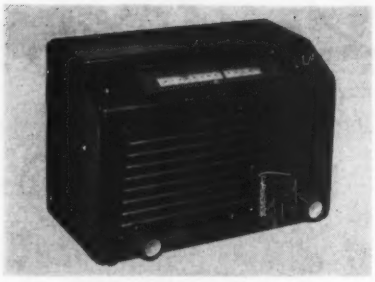

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the exit lane. When all of the vehicles have exited, the dispatcher shall be advised.

In certain large-scale operations, response of fire forces may be by convoy, as was the case during last year's flood emergencies, and before that, the extensive civil defense exercises. It is no small undertaking to assemble, dispatch and control large fire forces for efficient convoy even without the limited amount of routine red tape that must be followed in operating along the Thruway. This is particularly true where such movements occur on holidays or during the rush hours. Then it is important that those in command of dispatching and directing the movement of the fire forces work in close cooperation with the highway authorities. An oversight or other carelessness anywhere along the line may result in serious delay and annoyance to the responding forces, not to speak of the inconvenience of travelers.

Fire equipment and/or vehicles of fire personnel on normal trips

On the Thruway, fire equipment or the vehicles of fire personnel traveling without regulation signals such as flashing red or blue lights indicating that the trip is not of an emergency nature, shall be handled in the normal manner. Toll and exit tickets are processed just as they would be for pleasure cars and commercial vehicles, the usual toll being collected. It might be added that no fireman should be caught using his red or blue lights when he cannot prove he was on official fire business.*

The Thruway Authority issues the following instructions to its employees:

"It should be carefully noted that fire equipment and the vehicles of fire personnel proceeding to an emergency, with legally displayed flashing red or blue lights, are to be processed with the minimum of delay. The Authority specifically intends that fire equipment and personnel traveling to an emergency shall be granted free passage. The normal toll shall be paid for fire equipment and personnel when making a normal trip not in connection with an emergency."

Thruway pays for services

Beginning March 1, 1956, the Thruway Authority offered fire fighting forces along the route of the cross-state superhighway up to $200 a year to help fight fires on the Thruway.

Warren M. Wells, the Authority's Director of Operations, notified the coordinators in each of the 19 counties along the route, offering $50 for the first call on each calendar year, $35 for each additional call, up to a maximum of $200 annually. Payment will be made to the responding municipality, fire district or fire company.

This is said to be in direct line with the voluntary payments made by both

* In New York, volunteer firemen may display a blue light on their private cars. This does not entitle them to speed or ignore red lights or stop lights, and such signals can only be used when responding to an alarm.

the New Jersey Turnpike and the Pennsylvania Turnpike to local fire companies which answer calls along their expressways.

The Thruway Authority also agrees to defray the cost of extinguishing agents used by fire fighters in coping with Thruway fires and to replace damaged or lost minor fire fighting equipment.

Miscellaneous problems faced

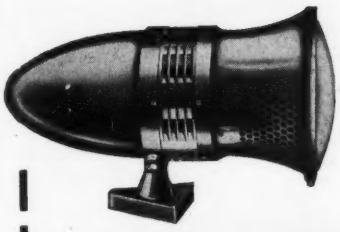
Many questions arise concerning Thruway fire protection beyond the major one of liability coverage. Most of these concern details of communications dispatch and response with which the Thruway Authority is not directly concerned.

Fire Crews—The volunteer companies have somewhat different problems than those of the full-paid departments, which roll on call, with their regular crews. It is recommended by some authorities that upon receipt of a call a volunteer unit should delay its response until it has received a full crew to man the rig. Other authorities prefer to dispatch the apparatus just as quickly as the driver can get it on the road, leaving it to the individual firemen to follow along in their cars.

This procedure is not viewed as happily by the Thruway Authority as having the unit respond with full crew, ready to go to work, providing the entire company membership will not come roaring along in their private cars. In a word, the Thruway officials have their own strategy for meeting emergencies on the highway. Police are stationed as quickly as possible on both sides of the incident to control and direct all traffic including responding fire forces. The fewer cars of firemen that use the highway, the easier it is for the police. They are instructed to permit the fire fighters to come as close as is considered expedient with their cars, which are to be located off the roadway. If the volunteer fire department can work out a response plan that will insure the minimum effective full crew responding either with the apparatus (which is preferable) or following it into action, this is the sort of Utopia the Thruway Authority would like.

Cars of Volunteer Firemen—Written instructions covering the detail issued by one county fire coordinator read as follows:

"It is imperative that the *fewest possible numbers* of motor cars of volunteer, or other firemen attempt to use the Thruway in responding to incidents on, or adjacent to the Thruway proper. Thruway Police will endeavor to halt all vehicles in the lane or lanes involved, a safe distance from the incident in order to enable fire and/or rescue operations to be conducted with least hindrance. Volunteers with blue lights on their cars will be asked to observe these regulations and cooperate by stopping their cars at least 500 feet from the incident, and parking them on the side of the road. Those firemen not immediately concerned with actual extinguishment and/or rescue operations may offer their assistance to



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Siren sounds a penetrating warning, red light automatically flashes authority. Traffic opens instantly, day or night. FREE ROLLING feature.

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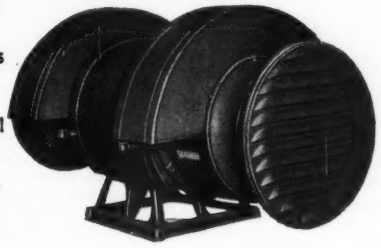

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POWER STEERING
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Garrison Power Steering is also available for other makes of wheeled, fire fighting apparatus, most makes and models of trucks, wheeled tractors, off-the-road construction equipment and some material handling equipment. Information will be sent upon request.

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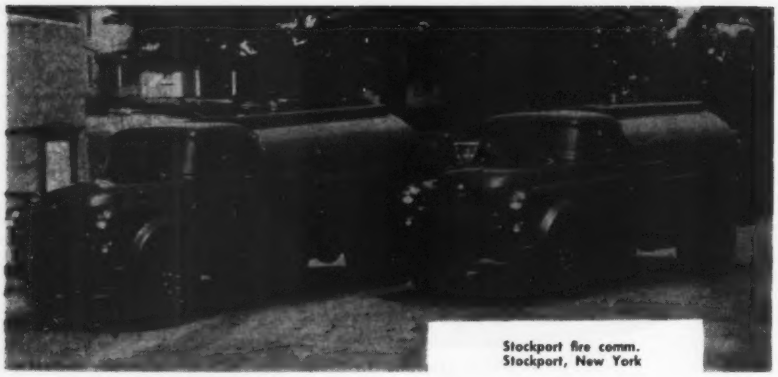

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Thruway Police in controlling traffic and maintaining order at the scene."

"Orphan territory"—Another problem is that of fires in "orphan territory" i.e.: areas not regularly assigned to or covered by any public fire department. Meeting emergencies in such areas, usually part of unincorporated and unorganized fire districts, is a headache to fire officials under even normal conditions, without their having the added worry of fires along the Thruway right-of-way to contend with. Thruway personnel manning Thruway fire equipment, will soon be in a position to fight all but the most severe of such fires. Meanwhile it is to the credit of the public fire services that the majority will respond to an emergency call received from the Thruway even where the fire is on disputed territory.

In order to facilitate response of fire forces to Thruway incidents, counties have been given detail maps of the Thruway, with its entrances, barriers, bridges (overpasses and underpasses) service installations and other details thereon. Where any sort of access lanes are available, even though cut off by fence or gates, fire departments may use these if it will facilitate their response. Under these conditions, the gate may have to be forced, or the fence opened or broken. However, this procedure, although it may be followed as a last resort, is not recommended by the Thruway Authority because of the danger to the fire forces entering upon the fast lanes with their heavy traffic, and the fact that no police protection may be immediately available at that access point.

Summary—Another question that is sometimes confusing, is that of command at the scene of the incident. It is reported that the Authority considers that the chief of the fire department in whose district or area the incident occurs is in charge, just as he would be in a normal fire operation.

The question of jurisdiction in time of fire has been a sore one on other turnpikes where not only volunteer but paid fire departments have been at odds with highway police and other authorities. Thus far, fortunately, the records indicate there has been no such cleavage along the New York Thruway.

Problem of the "Zee" Bridge—The only exception to most of the foregoing operational procedures it that of the $60 million Tappan Zee Bridge spanning the Hudson River. During its construction several incipient fires occurred on the structure, most of these being extinguished by workers or Thruway police. The Tarrytown, N. Y., Fire Department, which protects the Westchester County approaches to the bridge has responded to several calls and willingly cooperates with the Authority.

The Thruway has installed special fire units however, to protect the costly bridge. Present facilities include a standard pumper (rented temporarily) and a 1,000-gallon water tanker. There are also Thruway vehicles of sorts carrying first aid equipment always close at hand. It

is understood that when the new all-purpose fire units are received one will regularly be stationed at the Bridge. A Tarrytown municipal fire alarm box is located at the Westchester approach to the toll barrier and the department's apparatus is equipped with radio on the County fire frequency.

Specifications of special Thruway emergency fire apparatus

Twenty-three all-purpose units adaptable to the requirements of the Thruway Authority are now being delivered for installation throughout the route. These were produced by the Young Fire Equipment Corp., Buffalo, N. Y., to design specifications which include the following:

The truck, mounted on a two-ton chassis, is equipped with a four-stage centrifugal pump rated from 120 gpm to 50 gpm for from 400 to 800 psi. It has a turret nozzle mounted on the cab roof, and remotely operated from within the cab, to deliver water fog, fog-foam, or solid stream discharges.

There are also two ground sweep nozzles mounted at the front bumper which can deliver water fog and fog-foam. Behind the cab, on electrically-operated hose reels, are two 1-inch booster lines, each 250 feet long and equipped with fog nozzles. On the left side of the unit is a 1½-inch capped and gated discharge opening.

The vehicle carries a removable 330-gallon capacity water tank and has compartments for 5 gallons of wet water and 20 gallons of Liquid foam. Proportioners can also be operated from within the cab. Besides the siren and flashing lights, the apparatus carries such additional equipment as a 20-pound carbon dioxide extinguisher, two 25-foot lengths of 1½-inch hose rated at 400 psi working pressure; electric hand lanterns, a 20-pound dry powder extinguisher, 12-foot ladder, tool kit, hydraulic jack, a bayonet-type applicator and other equipment. Provision is made for radio. □□

Fire Control Unit Vents Through Roof

Fire fighters, public safety officials and others witnessed a demonstration of a new fire control device embodying principles of a fireplace, for venting heat, smoke and gases through the roofs of buildings at the Factory Mutual Laboratories in Norwood, Mass.

The equipment somewhat resembles a beehive; it is 4 feet square and about 14 inches high. One type had a plastic cone 10 inches at the peak. When excessive heat occurs, a fusible link snaps. This activates lifting mechanism which clips open the hinged cover.

The device, developed by engineers of the Wasco Products, Inc., of Cambridge, Mass., and Sanford, Me., was tried out in three gasoline-fed fires. In two of these the roof vents were activated. Hot gases and smoke rushed out, while adjacent sections of the building reportedly remained relatively cool.

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NO. 150 HIGH INTENSITY FLOOD R-40, 200-300 OR 500 WATTS.

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Here are lights designed for rugged fire service. Completely weather-proof, shock resistant, compact — sealed beam lamps deliver light output greater than lamps many times their size.
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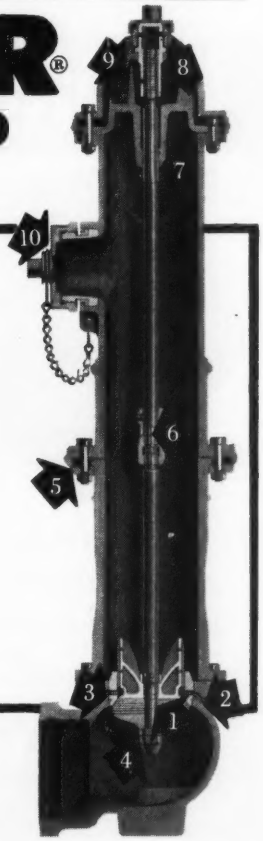

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Obituaries

Chief Frank C. McAuliffe

Frank C. McAuliffe, veteran chief of the Chicago, Ill., Fire Insurance Patrol, died on September 23. He was 62 years old, and had been ill for the last two years.

He was a member of one of Chicago's best known fire fighting families. His father, the late Jeremiah John McAuliffe, was a first deputy chief fire marshal; his brother, Jeremiah, is a retired chief fire marshal and his two sons, Jeremiah and Frank, are both officers in the department.

Chief McAuliffe joined the Chicago Fire Department on July 25, 1908, as an assistant engineer. He was made a truckman in January 1910 and assigned to command the newly organized Squad 1 in 1912. In 1916, he was promoted to lieutenant and to captain in February 1923.

On April 12, 1924, he resigned from the Chicago Fire Department to become chief of the Fire Insurance Patrol.

In 1945, Chief McAuliffe went to Europe on a special governmental mission to assess damage caused to enemy building by American bombs.

He was named president of the International Association of Fire Chiefs in 1947 and later served with the technical division of the Office of Civil Defense Planning.

He was well known as the author of several booklets and articles on salvage work.

Captain J. E. Tolan Dies Fighting Portland Fire

Captain John E. Tolan of the Portland, Me., Fire Department collapsed and died while fighting a two-alarm fire on August 27, 1956. Death was reported by the medical examiner to have been caused by a heart ailment aggravated by smoke inhalation and asphyxia.

Captain Tolan joined the Portland Department on October 17, 1938, was promoted to Lieutenant in 1943 and to Captain on January 6, 1949.

Cause of the blaze in a 156-year-old residence, a Portland landmark, was given as a painter's torch. Eight pieces of apparatus responded to the two alarms and South Portland and Pleasant Hill sent four units to stand by at the city's fire stations.

Former Chief J. M. Claxton

John M. Claxton, former chief of the Torrington, Conn., Fire Department died on September 6 in a private convalescent home in that city after a long illness. He was 82 years of age.

Mr. Claxton served as Fire Chief of the Old Mutual Fire Company volunteers

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AN OUTSTANDING SAFETY TOOL FOR CUTTING "HOT" ELECTRICAL LINES
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Cuts energized or cold lines and cables by the hot stick method with extensions. This allows the operator to work from a safe position out of the falling wire area and can be operated with comparative ease at distance of 30 feet.

Wire or cable to be cut can be found even under blackout or fire conditions. The cutter is placed beyond the wire to be cut and drawn back until wire drops into a 1½" slotted jaw, here it is held by gravity until cut is made. Once held in the jaw, the wire cannot escape because the jaw closes at the outside first, actually reversing the cutting power application. The **LONGRANGE** cuts from the outside in rather than from an axis out. Cut is smooth due to a circular cutting action of the jaw. Insulating materials will not gum the jaws. Jaw opening 1½" permits cutting or clearing of wires in conduit.

Handles are normally supplied in 4 foot sections, insulation tested for 75,000 volts per foot. Made of carefully selected douglas fir or spruce, straight grain with a minimum of 16 annual growth rings per inch.

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When he needs it—where he needs it
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PORTABLE ELECTRIC HAND LAMPS

Model 700-A 2000-foot beam
Most powerful, heavy-duty hand lamp of its size. Adjustable 6-inch head. Operates on four standard No. 6 dry cells.

Model 211 1500-foot beam
Popular price, light weight, easy to carry. Adjustable 5-inch head. Holds two standard 6-volt lantern batteries. Operates on one; other is a spare.

Write for folder on complete information on these and other Big Beam dry-cell and storage-battery models.

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from 1919 to 1922. He retired in 1952 after 62 years as a druggist. He was also a representative in the Connecticut State Legislature during the 1915 and 1917 sessions.

Tom Magner

Richard Jacoby, founder of *Brandschutz*

Richard Jacoby, former Inspector of Fire Fighting and Fire Prevention in the Ministry of the Interior of the State of Baden-Wurttemberg, Germany, died of pneumonia on June 2nd. He was 72.

He was the son of the founder of Stuttgart's first professional fire department. After receiving his professional training, he served for some time as fire chief of the Badische Anilin-und Sodafabrik of I. G. Farben in Ludwigshafen.

In 1945 Chief Jacoby undertook to rebuild the shattered fire fighting system in Wurttemberg and Baden and was influential in the creation of various federal technical fire organizations and committees. He became founder of the German fire journal *Brandschutz* and remained on its editorial staff upon his retirement from active duty in 1952, when he was decorated with the Order of Merit by West German President Theodor Heuss.

World-Wide Fire News

Fatal Florida Bomber Crash

Three crewmen of a crippled Navy bomber and a three-year-old girl were killed when the plane, seeking a landing spot, crashed into two houses near Sanford, Fla., August 27, setting them afiire. The child's parents and her four-year-old brother were critically injured. The owner of the house next door was blown into the yard but escaped severe injury.

Both houses burned fiercely but fire fighters from the Navy auxiliary field and Sanford firemen saved one house from complete destruction and later recovered the bodies.

The bomber apparently developed engine trouble soon after taking off and the pilot attempted a crash landing on a railroad track to spare built-up areas, but a wing clipped a tree and caused the crack-up and fire.

From the World News Ticker

Towering flames roared through dry brush and forests in half a dozen areas north of the French Riviera on a 25-mile front, August 30th. One fire got within 500 yards of the principality of Monaco before firemen and volunteers beat it back. . . . The 7,131-ton British steamer Herminius, out at sea, wirelessed that a chemical fire was raging in one of her holds. The master reported that the fire and hot weather had raised the shipboard temperature to 130 degrees. . . . Nearly 2,000 houses were destroyed by fire in a crowded area of Jakarta on August 2.

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IDENTIFICATION SIGNS PERSONNEL ALL FIRE DEPARTMENTS

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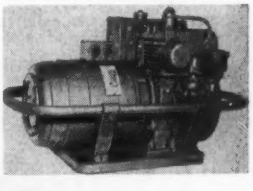

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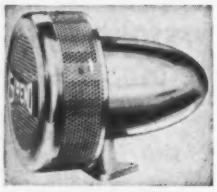

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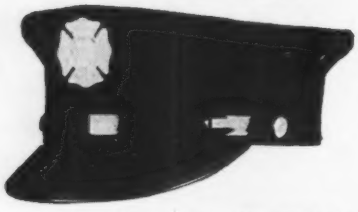

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Brunssen Caps

Some casualties reported. . . . The Pan American air freight terminal, a bonded warehouse at the Jose Marti International Airport outside Havana, burned on August 5 with loss, including merchandise, of $1 million. . . . Forty-five New York City firemen received graduation certificates August 10 after completing the Civil Defense course in radiation detection and decontamination. . . . On August 18 a forest fire broke out near the summer residence of Pope Pius XII. Workers and reserve servicemen called from Rome, got the fire under control on the 19th. . . . Complaint from the East German Communist Party newspaper "Neues Deutschland" claimed on August 19 that American propaganda balloons set fire to cornfields in two East German districts the week before. . . . In Grasse, France, 15 persons including three policemen, were reported dead or missing following a struggle to control a wind-whipped forest fire that reached to within 200 yards of the town of 13,000. . . . In Landstuhl, Germany, fire on August 18 destroyed a clothing warehouse with damage estimated at $350,000. U. S. Air Force firemen prevented the blaze from spreading to adjacent buildings storing millions of dollars worth of aircraft parts. Eight firemen were overcome by smoke. . . . A powerful explosion during the night of August 10 in the Casbah, crowded Moslem section of Algiers, collapsed four buildings on their sleeping occupants and left five dead and twelve injured. Firemen and rescue workers toiled well into the next day to reach victims trapped under the debris. No cause was given.

French Atom Center Fire

French firemen were checked with Geiger counters after battling a fire at an atomic research plant making radioisotopes at Fort Chatillon, south of Paris.

The struggle to control the fire, which licked around a lead-bound vat of atomic materials, brought injuries to five of the fire fighters. Two were overcome by fumes, one injured by flying glass and two others suffered minor hurts during the action.

The fire was controlled after an hour and a half fight.

August Fire Losses

Estimated fire losses in the United States during August amounted to $74,930,000, the National Board of Fire Underwriters has reported.

According to Lewis A. Vincent, NBFU's general manager, this $74,930,000 loss represents an increase of 9 per cent over losses of $68,752,000 reported for July and an increase of 5.4 per cent over losses of $71,103,000 reported for August 1955.

Losses for the first eight months of 1956 now total $661,085,000, an increase of 9.7 per cent over the first eight months of 1955, when they amounted to $602,474,000.

These estimated losses include an allowance for uninsured and unreported losses.

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Schools and Conferences

Oct. 22-26—National Safety Council. Annual Safety Congress and Exposition, Chicago, Ill. For further information write R. L. Forney, Secretary, National Safety Council, 425 N. Michigan Avenue, Chicago 11, Ill.

Oct. 23-25—Illinois Firemen's Association. Annual meeting, Springfield, Ill. Secretary, Roy W. Alsip, Box 8, Champaign, Ill.

Oct. 24-26 (tentative)—Arizona State Fire Training School. Annual meeting, Phoenix, Ariz. Director, Battalion Chief Jake Siken, Fire Fighting Instruction Supervisor, 49 South 1st Street, Phoenix, Ariz.

Nov. 2-3—International Rescue and First Aid Association. Annual meeting, Toledo, Ohio. For information, write Max Spray, 201 South Washington Street, Alexandria, Va.

November 3—Keystone State Fire Chiefs Association. Fall meeting, Mt. Pocono Fire Station, Mt. Pocono, Pa. For information, contact Lewis M. Atkinson, Recording Secretary, Malvern, Pa.

November 6—**Morris County Fire School,** to be held at Mendham School, Mendham, N. J., at 8 p.m. For information, contact Robert H. Wright, Publicity Committee, Long Hill Lane, Chatham, N. J.

November 11—**Missouri Valley Association of Fire Chiefs.** Annual meeting, Columbus Hotel, Miami, Fla. For information, contact Chief Ray Tiller, Secretary-Treasurer, 319 East 5th Street, Waterloo, Ia.

November 11—**Southeastern Association of Fire Chiefs.** Annual meeting, Everglades Hotel, Miami, Fla. For information, contact Chief G. A. Mitchell, Secretary-Treasurer, Fire Headquarters, Opelika, Ala.

November 11—**Great Lakes Division, International Association of Fire Chiefs.** Annual meeting, Hotel Alcazar, Miami, Fla. Secretary-Treasurer, Chief Elmer Stough, 605—4th Street, Lorain, Ohio.

Nov. 12-16—International Association of Fire Chiefs. Annual meeting, Miami, Fla. Secretary-Manager, B. Richter Townsend, Hotel Martinique, Broadway at 32nd Street, New York 1, N. Y.

December 4—**Morris County Fire School,** to be held at Morristown High School, Morristown, N. J., at 8 p.m. For information, contact Robert H. Wright, Publicity Committee, Long Hill Lane, Chatham, N. J.

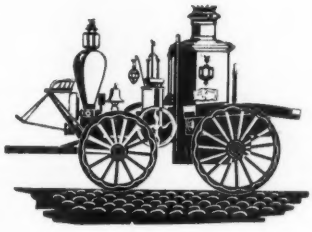
Seneca Hose Installs Radio Alerting Systems

The final step in completing the mutual aid radio system in Fire District #5, Town of West Seneca, N. Y., was taken last spring when 38 "monitor" receivers were placed in the homes of firemen of the Seneca Hose Company.

Henceforth, directions to the firemen will be broadcast over the receivers, eliminating the previous slow practice of volunteers having to travel to the fire house or being called by telephone to learn the location of the fire or first aid call. Officers of the company believe that valuable time will be saved in getting men to the scene of the emergency, with resultant saving of lives, particularly if evacuation is necessary.

A new system will operate as a part of the present Erie County fire radio setup, which was placed in operation this past year and provides two-way radio communications with fire apparatus of 96 volunteer fire companies in the county's 1,000 square miles.

Franklin T. Boeck



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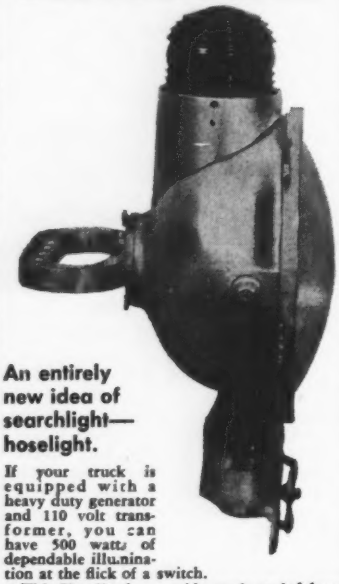

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Publications Received

FORCIBLE ENTRY, ROPE AND FIRST AID EXTINGUISHING PRACTICES, Unit I in Fire Service Training, published in 1956 by Fire Protection Department, Oklahoma A. & M. College, Stillwater, Okla. Price $1.00.

SALVAGE AND OVERHAUL PRACTICES, Unit IV in Fire Service Training, published in 1956 by Fire Protection Department, Oklahoma A. & M. College, Stillwater, Okla. Price $1.00.

FIRE APPARATUS PRACTICES, Unit VI in Fire Service Training, published in 1956 by Fire Protection Department, Oklahoma A. & M. College, Stillwater, Okla. Price $1.50.

VENTILATION PRACTICES, Unit VII in Fire Service Training, published in 1956 by Fire Protection Department, Oklahoma A. & M. College, Stillwater, Okla. Price $1.00.

FIRE DEPARTMENT OFFICERSHIP, Unit I in Fire Department Administration, Published in 1956 by Fire Protection Department, Oklahoma A. & M. College, Stillwater, Okla. Price $2.00.

FIRE PROTECTION OPERATION, Unit II in Fire Department Administration, published in 1956 by Fire Protection Department, Oklahoma A. & M. College, Stillwater, Okla. Price $2.00.

FIRE SAFETY EDUCATION. Published by the Elementary Division, Office of Los Angeles County Superintendent of Schools. A teacher's guide for fire prevention in education in the schools.

ONE AND TWO-FAMILY DWELLINGS, Fire Record Bulletin FR 56-2. Contains a factual summary of fires in dwellings, data on fire origin and location, home fire inspection data, etc. Available from National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. Price 50 cents.

IOWA FIRE LAWS. Bulletin containing the first compilation of all laws pertaining to fire regulations in the State of Iowa. Chapters cover establishment of fire protection, financing, appointment of personnel, fire regulations, inspections and investigations, fire crimes, vehicle and traffic laws, etc. Available from Engineering Extension, Iowa State College, Ames, Ia. Price $2.00.

FIREMEN'S TRAINING COURSE—Section I —Basic, published by Fire Service Extension, Robert C. Byrus, Director, University of Maryland, College Park, Md. Manual covers essentials of a fireman's training. The ten chapters include: Organization and Discipline; Small Tools; Hose Evolutions; Ladder Evolutions; Fire Behavior; Fires in Natural Cover Fuels; Breathing Equipment; Portable Fire Extinguishers; Salvage; Rope and Knots; Ventilation and Fire Streams. Price $2.50 to non-students of Fire Service Extension.

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MASTER OF THE ROAD — AND LOAD
GIVES BRAKES WHETHER OR NOT THE MOTOR IS RUNNING — AND IN MOST CASES IF BOOSTER OR MASTER CYLINDER FAILS. GIVES BETTER CONTROL OF EVERY STOPPING, HOLDING, AND STARTING OPERATION—WHETHER THE TERRAIN IS ROUGH OR HILLY—OR THE LOAD LIGHT OR HEAVY.

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THOUSANDS PRAISE ITS SAFETY AND DEPENDABILITY

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BRAKES EASILY RELEASED
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NO INTERFERENCE WITH CONVENTIONAL BRAKES

Offered By MANUFACTURERS — JOBBERS — DEALERS

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New Canadian Stamp Promotes Fire Prevention

The Canadian Government of October 9, 1956, issued the world's first postage stamp to promote fire prevention. Its issuance was part of the Canadian Fire Safety publicity campaign waged during Fire Prevention Week, October 7-13. The date marks the anniversary of the famous Chicago Fire which later became the inspiration for Fire Prevention week in the United States and Canada.

A stamp was first proposed several years ago by the Association of Canadian Fire Marshals, supported by the Canadian Association of Fire Chiefs and other Dominion fire service organizations. The finally selected design is a striking looking stamp in black and red, with the slogan in English and French: "Prevent Fires." It is a five-cent denomination, the regular letter rate for Canada for both surface and air mail.

This is said to be only the third time in 20 years that the Canadian Government has issued a stamp in two colors. The design is the work of Arthur Price, an Ottawa artist.

Both the United States and Panama have previously issued postage stamps dealing with the fire service, but these have honored fire fighters and were not intended to popularize fire prevention. The United States three-cent stamp commemorating the nation's volunteer firemen was issued October 4, 1948, at Dover, Delaware.

Flying Fire Alarm

Like the cavalry of old, a Los Angeles Police helicopter recently was credited with saving a dozen Hollywood homes from a brush fire.

While on the freeway traffic patrol, Pilot Robert Van Aiken and Police Observer Dick Gillenberg noticed a plume of smoke from the Laurel Canyon area.

As Van Aiken hovered over the blaze in the 8100 block of Gould Ave., the observer notified L. A. City firemen.

Assistant Chief Forest W. Moore and five city fire units from the Hollywood area and Mountain Patrol arrived to save all of the homes.

Meanwhile, one of the residents, Dorothy Gonzales, 8169 Gould, became curious at the noise of the whirlybird, went outside, saw the fire, and used a garden hose to save her own house.

—Cliff Dektar

A PROVEN
Life Saver!
Every **FIRE COMPANY** *should have a*

Can be operated from portable electric generating units.

KEY-HAK
RESCUE KIT!

1 Key-Hak heavy-duty portable electric Hack Saw.

1 Blade Kit consisting of 36 assorted metal and wood cutting blades.

1 Heavy gauge Steel Carrying Case.

- Eliminates the fire hazards of a cutting torch, particularly in automotive emergency rescues.
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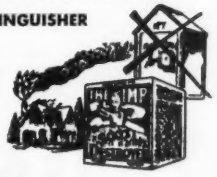
- Extracting trapped people.

If your local Fire Equipment Dealer is unable to supply you, write direct to

KEY-HAK DIVISION
PRODUCERS AND DISTRIBUTORS, INC.
1321 Hanover Avenue, ALLENTOWN 50, PA.

Chief---
CAN YOU PUT OUT A CHIMNEY FIRE For 65¢? —YOU CAN WITH IMP
CHIMNEY FIRE EXTINGUISHER



Save rushing to chimney fires—avoid slippery roofs by using IMP Chimney Fire Extinguisher. Just throw a 65¢ package "as is" on the hottest part of the fire in the stove, furnace or fireplace. The chimney fire will be out in jigtime without water or chemical damage. Recommended by many chiefs who carry IMP in their cars. ALSO —LIQUID IMP for *oil fired units,* is as much a fire preventative as pkg. IMP. Saves oil, money, increases heat, prevents sludge, reduces carbon deposits and is safe. You know what a fire hazard sludge is. Use LIQUID IMP in your own burners. 3½ oz. enough for 90 gals. kerosene or 55 gals. No. 2 fuel oil; 16 oz. enough for 5 times above quanity; 1 gal. enough for 1600 gals. #2 fuel.

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.....quarts Liquid IMP @ $4.10 per qt.
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ADDRESS.....

CITY..... STATE.....

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The new Float Dock Strainer makes most any stream or pond useable for fighting rural fires or for filling your tanker. Float Dock will draft in deep or shallow water — off the bottom and drafting always the cleanest water with never a whirlpool or loss of suction at any time. Saves wear on your pump, too.

Strainer drafts just below the surface and down to the last few inches.

WRITE your distributor or manufacturer for brochure and prices. Specify hose size.

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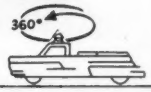

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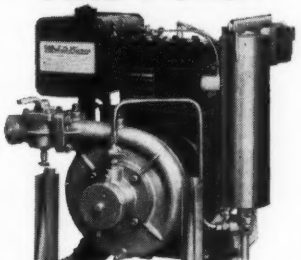

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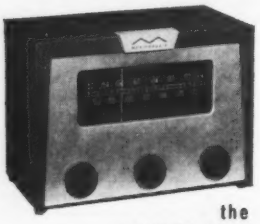

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DETROIT DIESEL ENGINE DIV., GENERAL MOTORS 994
DU MONT LABORATORIES, INC., ALLEN B. 1017
DUO-SAFETY LADDER CORP. 818
DU PONT DE NEMOURS & CO., E. I. 810; 851

E & J MANUFACTURING CO. 841
EAGLE SIGNAL CORP. 855
EASTMAN CO., SAMUEL 859
ELECTRONIC PROTECTION, INC. 978
ELKHART BRASS MFG. CO., INC. 821
EMERSON CO., J. H. ..... Inside Front Cover
EUREKA FIRE HOSE; DIV. U. S. RUBBER CO. 971
EVERSON-ROSS, INC. 1026
EXCELSIOR BRASS MFG. CO. 1013

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FALCON ALARM CO., INC. 1024
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FOARD & CO., F. C. 1031
FOL-DA-TANK CO. 1003, 1032
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FOUR WHEEL DRIVE AUTO CO. ..... 959–962; Back Cover
FULTON BAG & COTTON MILLS 996
FYR-FYTER CO. 852

GAMEWELL COMPANY 894
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HARRON LABS 1022
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JAVELIN TOOL & SUPPLY CO. 1018
JOHNSON MOTORS 854

KATOLIGHT CORP. 1027
KEY-HAK DIV., PRODUCERS & DISTRIBUTORS, INC. 1031
KOEHLER MFG. CO., INC. 1016
KOHLER CO. 1003

LANE, E. B. 1027
LEECE-NEVILLE CO. 844–845
LINCOLN LABORATORIES, INC. 1006

McDERMOTT CORP., J. A. 887
McINTIRE BRASS WORKS, F. N. 885
MACK FIRE APPARATUS 811
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PYROTRONICS DIVISION, BAKER INDUSTRIES, INC. 813

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REESE, STANLEY M. 1032
REO MOTORS, INC. 884
REPUBLIC RUBBER DIV., LEE RUBBER & TIRE CORP. 808
ROCKWOOD SPRINKLER CO. 816–817
RUSSELL UNIFORM CO. 1029

SAFA ALARM DIV., FYR-FYTER CO. 874
SAFETY FIRST PRODUCTS CORP. 872
SAWYER & SON CO., THE H. M. 860
SCOTT AVIATION CORP. 982–983
SEAGRAVE CORP. 829
SHARPSVILLE STEEL FABRICATORS, INC. 878
SIRENO CO., INC. 1028
SMITH & CO., D. B. 823
SNYDER & SON, INC., M. L. 1026
STEPHENSON CORP. 1017
STERLING SIREN FIRE ALARM CO., INC. 1023
SUPER-VACUUM MFG. CO., INC. 827

THERMOID CO. 865
TRIPPE MANUFACTURING CO. 1033

U-C LITE MFG. CO. 1027
UNIVERSAL FIRE APPARATUS CORP. 862
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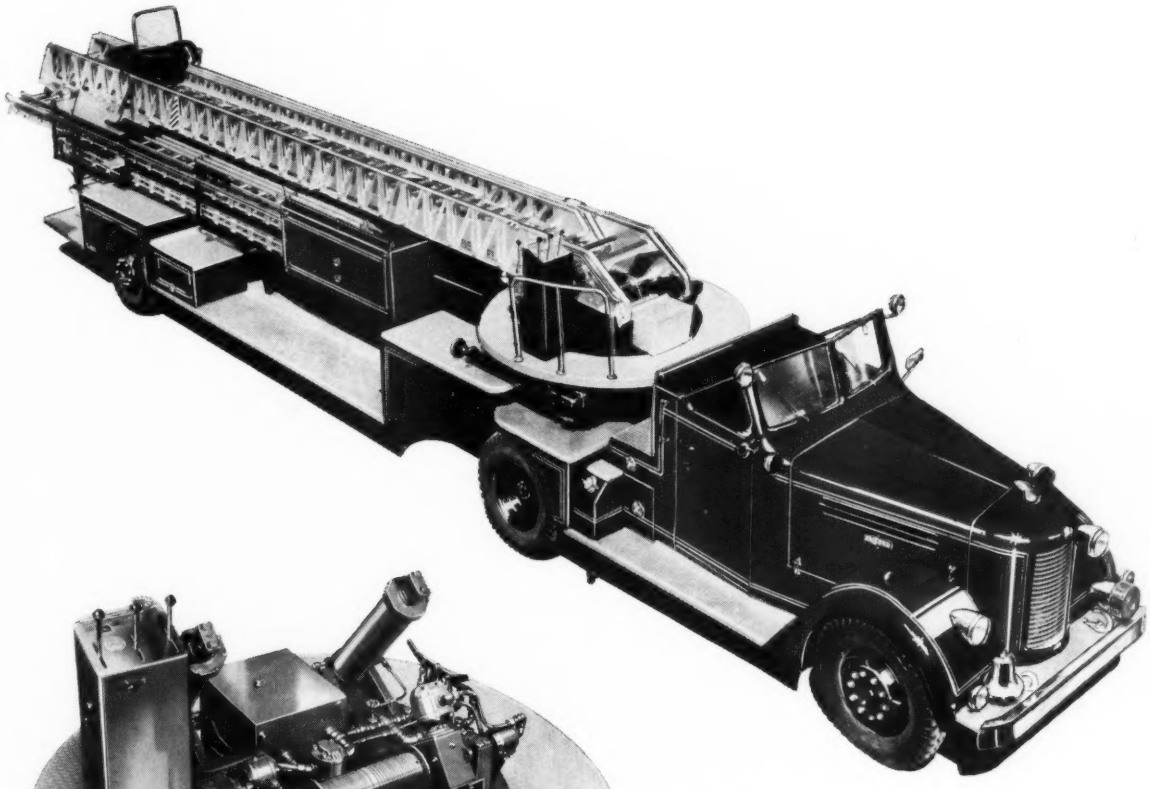
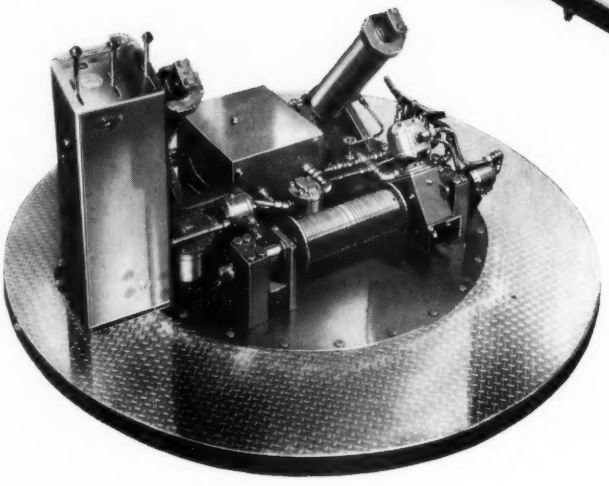
WARD LAFRANCE TRUCK CORP. 824–825; 1033
WASHINGTON PRODUCTS CO. 980
WATEROUS COMPANY 834
WAUKESHA MOTOR CO. 840
WENTWORTH-FORMAN CO., INC. 1030
WHERE TO BUY 963–970
WINPOWER MFG. CO. 1011
WOOSTER BRASS DIV., FYR-FYTER CO. 832–833

YOUNG FIRE EQUIPMENT CORP. 880





The Pirsch Full-Hydraulic Aerial Hoisting Mechanism is available on Pirsch Intermediate and Pirsch Senior Aerial Ladder Trucks; for 65', 75', 85' and 100' Pirsch Aerial Ladders.

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The new Pirsch Full-Hydraulic Aerial Ladder Hoisting and Operating Mechanism offers the last word in modern design and incorporates the latest and best in the way of hydraulic application to the operation of aerial ladders.

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